THE USE OF RADIO FREQUENCY IDENTIFICATION SELF-HELP CIRCULATION SERVICES FOR THE DELIVERY OF USER SERVICES AT THE UNIVERSITY OF SOUTH AFRICA LIBRARY SERVICES

by

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Submitted in accordance with the requirements for the degree of

MASTER OF ARTS

in the subject

Information Science

at the

UNIVERSITY OF SOUTH AFRICA

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2017

DECLARATION

Student Number: **53327349**

I hereby declare that **"The use of radio frequency identification self-help circulation services for the delivery of user services at the University of South Africa Library Services"** is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

I further declare that I have not previously submitted this work, or part of it, for examination at Unisa for another qualification or at any other higher education institution.

Mr Francois Keyser November 2017

ABSTRACT

This study investigated the factors, best practice, advantages and disadvantages that influence the use of radio frequency identification (RFID) self-help circulation services for service delivery by South African academic libraries with specific emphasis on the University of South Africa (Unisa) Library. Unisa Library Services is the only library service in South Africa that has implemented a fully-fledged RFID self-help circulation service. There must therefore be reasons why other libraries in South Africa have not implemented this type of service. Accordingly, a need was identified to investigate the aspects that should be considered before a library decides to implement such a circulation service. There was also a need to identify the factors, best practice, advantages and disadvantages that influence the use of RFID self-help circulation services.

The study gives a brief overview of RFID technology and its use in libraries internationally with specific emphasis on its use for self-help circulation purposes. Through a literature study, certain factors, best practice, advantages and disadvantages that influence the use of RFID self-help circulation services were identified. The identified factors, best practice, advantages and disadvantages were subsequently used to compile questionnaires to obtain information from Unisa library users (students and staff). Only Unisa staff and students who were situated close to Unisa campuses with RFID self-help circulation services were included in the study. During the analysis of the data collected additional factors, best practice, advantages and disadvantages were identified.

Recommendations were compiled regarding the factors, best practice, advantages and disadvantages that influence the use of RFID self-help circulation services. These recommendations are meant as a guide for South African libraries when making decisions on the possible implementation and use of RFID self-help circulation services.

KEYWORDS

Factors, Best practice, Advantages, Disadvantages, Radio frequency identification (RFID), RFID self-help circulation services, Unisa Library Services, Literature study, Questionnaires, Data analysis, Recommendations, Decision-making

ACKNOWLEDGEMENTS

Letitia Keyser and Xander Keyser for their patience and support and my family for their interest and support.

My supervisor, Prof. Van der Walt, for his valuable guidance in the completion of this dissertation.

Alexa Barnby for her excellent editing.

My colleagues for their interest.

Unisa for the study assistance and Research and Development leave.

My Maker, without whom this would never have been possible.

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LIST OF ABBREVIATIONS AND ACRONYMS

EM:	Electro-magnetic
ICT:	Information and Communications Technology
LMS:	Library management system
NISO:	National Information Standards Organisation
NMMU:	Nelson Mandela Metropolitan University
NWU:	North West University
ODeL:	Open distance e-learning
RFID:	Radio frequency identification
RU:	Rhodes University
SIP2:	Standard Interface Protocol 2
SPSS:	Statistical Package for the Social Sciences
TSA:	Technikon South Africa
UJ:	University of Johannesburg
Unisa:	University of South Africa
Univen:	University of Venda
VUT:	Vaal University of Technology
Wits:	University of the Witwatersrand

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND TO THE STUDY

Radio frequency identification (RFID) technology is used in various fields internationally, including the retail sector, military applications, automatic toll-fee payments and tracking the whereabouts of various items like products and even animals (Gheorghe 2011:123; Sukhula, Chaudhary & Neeraj 2011:25).

RFID technology uses radio waves, tags and tag readers to carry and read information (Driscoll 2005:89; Hui & Luk 2013:26–27). The tag contains a computer chip with information programmed on it. Tags also have an antenna that sends the data to the tag reader, which uses radio waves to read the information on the tag. This information is subsequently transferred and matched against a database when the tag reader or device communicates with the database.

The use of RFID technology in libraries started in the 1990s when libraries began to use the technology to speed up the self-help circulation of library material. Prior to the introduction of RFID technology, self-help circulation was performed using the barcodes on these items. One of the advantages of RFID technology is the fact that barcodes have been replaced by RFID tags which contain information that is readable at a distance. In libraries this means that it is not necessary for the tags to be visible for the information to be accessed. When accessing information on the tags in library material, the barcodes have to be visible (Pandian 2010:13; Singh & Midha 2008:440; Systems Librarian 2016).

RFID technology is used in libraries in the form of a self-help circulation service for library users. Such a service consists mainly of self-help issue and book return stations that allow users to issue and return items themselves with limited assistance from library staff (Singh & Midha 2008:442–443; Sukhula, Chaudhary & Neeraj 2011:26–28). In libraries, such technology can also include RFID staff circulation workstations that are able to read the tags, sorting machines to sort the returned items according to their shelving location, inventory control systems and even RFID security gates.

While staff in a library with RFID self-help circulation services are still available to deliver a circulation service, users are more independent in the use of the service. In fact, staff are only directly involved in assisting new users with the self-help circulation service and in cases when users encounter problems.

In his study of Australian academic libraries, Butters (2008:199–201) found that RFID self-help circulation service implementations were mainly applied in Australian public libraries and their application was very limited in academic libraries. He suggests that a possible reason for this is that academic libraries have much bigger collections than public libraries, therefore making the costs in this regard for academic libraries much higher. In addition, the tagging of large collections will take longer and hence be costlier in terms of staff time spend.

Butters (2008:199–201) also found that where RFID self-help circulation services had been implemented in Australian public libraries and academic libraries, it led to an increase in the efficiency of circulation services, thus allowing staff to be available to assist the users of academic libraries with other services they offer, like training. This trend is confirmed by Gheorghe (2011:122) as occurring in the Bucharest Central University Library. Dawes (2004:9) and Norwood and Skinner (2012:164) also found that RFID self-help circulation services reduced the pressure of delivering a circulation service to users in academic libraries thus enabling staff to deliver services focused on users' specialised needs. McDonald (2011:25) also reveals that by implementing RFID self-help circulation services, staff roles will change because circulation staff will now be available to concentrate on teaching clients not only about the use of the new RFID technology but also about the use of, for example, online library services.

Neal (2009:463–464) emphasises the important role that RFID self-help circulation services can play by highlighting that academic libraries serve a variety of users with various specialised research and subject-specific needs. These users include students, who range from undergraduates to postgraduates in various faculties, as well as faculty staff. Therefore, the staff of academic libraries should focus on delivering a specialised library service catering for a variety of users. Hence, training of users in the use of these specialised services is crucial. RFID self-help circulation services in these libraries should therefore enable circulation staff to be more available for assisting users in fulfilling their specialised needs for information. By considering the specialised needs of

the user populations of academic libraries, users can be provided with a more efficient service. Singh, Brar and Fong (2006:27) and Singh and Midha (2008:444) also found that RFID automatic sorting of returned items rendered staff more available to assist the users of academic libraries in fulfilling their specialised needs for information and services.

RFID self-help circulation technology is expensive to implement, not only in terms of money but also in terms of staff time (McDonald 2011:25; Systems Librarian 2016). While the highly specialised equipment itself is expensive, implementation is also costly, as a company must be paid to install and configure the equipment and software supplied, as well as for the project management of the implementation. Standard Interface Protocol (SIP2) licences must be obtained from the library management system (LMS) vendor to cater for integration of the RFID self-help technology with the LMS. As most libraries, including academic libraries, have budget restrictions it becomes even more important that the funds committed to implementing this technology be justified. This makes it important that RFID self-help circulation services in academic libraries have a positive influence on service delivery to ensure a good return on investment. Ayre (2012b:17–19) emphasises that the value of RFID self-help circulation services lie in comparing the financial investment with its service delivery benefits.

Taking into account the use of RFID self-help circulation services technology in academic libraries internationally and the subsequent effect on service delivery by library staff to users, as discussed above, it is necessary to identify the factors, best practice and advantages and disadvantages that influence the use of RFID self-help circulation services. The user experience of RFID self-help circulation services will depend on whether or not the RFID solution is implemented effectively. This can be assessed by taking into account the relevant factors, best practice and advantages and disadvantages. The users of this technology will not only be the library users but also the staff delivering the library service. If the staff do not experience this technology favourably, their attitude will have a negative effect on the library users' perception of the RFID self-help services.

In 2016, the University of South Africa (Unisa) Library Services was the only academic university library in South Africa that had implemented RFID self-help circulation

services, although seven other university libraries had implemented self-help circulation services only (Systems Librarian 2016). While RFID self-help circulation services use the information on RFID tags in the items for circulation purposes, self-help circulation services still use the item barcodes, although both of these services have self-help circulation in common. The seven libraries using only self-help circulation services (and *not* RFID self-help circulation services) are:

- Nelson Mandela Metropolitan University (NMMU)
- North West University: Mafikeng campus (NWU)
- Rhodes University (RU)
- University of Johannesburg (UJ)
- University of Venda (Univen)
- University of the Witwatersrand (Wits)
- Vaal University of Technology (VUT)

A similar trend was identified by Butters (2008:198), in his study of Australian libraries, who found that by 2008 only a limited number of academic libraries in that country were using RFID tags and equipment to circulate library items.

In South Africa, of the seven libraries listed above, six are using item barcodes for self-help circulation (non-RFID), while the remaining library (VUT) uses a combination of item barcodes (non-RFID) and tags (RFID). The reason for the latter is that not all their items have been supplied with RFID tags, leaving many items with only barcodes for circulation and inventory purposes. The reasons for this trend with seven academic libraries that have not yet implemented fully-fledged RFID self-help circulation services need to be investigated by studying the factors, best practice, advantages and disadvantages that influence the use and implementation of RFID self-help circulation services.

The seven university libraries mentioned are all residential libraries. By contrast, Unisa Library Services is an open distance electronic learning (ODeL) library service. This means that students have electronic access to library resources through the e-resources available in the online library catalogue. By 2015, Unisa had seven colleges and close to 400 000 students. Students can enrol for undergraduate studies,

postgraduate studies, diplomas, certificates and short learning programmes. Unisa staff is categorised into seven categories with a total of 4 236 staff members (Unisa 2015).

Electronic access to resources is the main method by which Unisa students who are not on campus can access library resources. In addition, books and audio-visual material may be obtained by requesting them using the Unisa online catalogue. This library material is then delivered using the postal service or couriers. In addition, many students visit the Unisa regional campuses which are spread across South Africa and in Ethiopia. Unisa library management thus found it necessary to investigate innovative ways of fulfilling the specialised information needs of these students. It was also felt that circulation librarians should be able to spend more time on meeting these needs by training students in the use of the e-resources available. Subsequently, the possibility of using RFID self-help circulation services was investigated, as these would enable students to help themselves, leaving circulation librarians to spend more time training and assisting students with their specialised information needs.

The identification of the factors, best practice and advantages and disadvantages that influence the implementation and use of RFID self-help circulation services will give an indication why Unisa is the only library in South Africa that has implemented these services. It will also contribute to compiling a list of recommendations regarding the best practice, factors and advantages and disadvantages that influence the implementation of RFID self-help circulation services in South African academic libraries. The focus of the study will therefore be on the identification of the factors, best practice, advantages and disadvantages that influence the use of RFID self-help circulation services for the delivery of user services in South African academic libraries with specific emphasis on the Unisa Library Services.

1.2 STATEMENT OF THE PROBLEM

Based on what has been described in the background to the study, the problem that was investigated is what factors, best practice and advantages and disadvantages influence the use and implementation of RFID self-help circulation services for service delivery to library users in South African academic libraries.

1.3 AIM AND OBJECTIVES

The aim of the study was therefore to establish the factors, best practice, advantages and disadvantages that influence the use of RFID self-help circulation services for service delivery by South African academic libraries with specific emphasis on the Unisa Library.

The main objectives of the study were:

- Identify the factors that have an influence on the effectiveness of RFID self-help circulation services in academic libraries (with the focus on Unisa).
- Identify best practice for the implementation of RFID self-help circulation services in academic libraries (with the focus on Unisa).
- Identify the advantages and disadvantages of implementing RFID self-help circulation services in academic libraries (with the focus on Unisa).
- Compile recommendations that should be considered before a library decides to implement RFID self-help circulation services.

1.4 RESEARCH QUESTIONS

Research questions need to be formulated to focus the research (Leedy & Ormrod 2013:2; Saunders, Lewis & Thornhill 2012:27; Staines, Johnson & Bonacci 2008:2–3). In this study the following questions were asked in order to address the objectives:

Table 1.1 Research questions and objectives

Objectives	Questions
Identify the factors that have an influence on the effectiveness of RFID self-help circulation services in academic libraries.	What factors contribute positively/negatively to the RFID self-help technology experience? Why has only one South African library implemented RFID self-help services?

Table 1.1 (cont.) Research questions and objectives

Objectives	Questions
Identify best practice for the implementation of RFID self-help circulation services in academic libraries.	What is the best practise for ensuring an effective RFID self-help service in academic libraries?
Identify the advantages and disadvantages of implementing RFID self-help circulation services in academic libraries.	What are the advantages and disadvantages of implementing RFID self-help technology in academic libraries? Why do libraries and specifically academic libraries implement RFID self-help technology? Why has only one South African library implemented RFID self-help services?
Compile recommendations to be considered before a library decides to implement RFID self-help circulation services.	What should a library consider before implementing RFID self-help circulation services?

1.5 SCOPE AND LIMITATIONS OF THE STUDY

The study focused on students and staff at Unisa. Unisa campuses are spread across South Africa and Ethiopia and students generally visit the campus closest to them. Of these campuses, 13 have libraries and, by 2015, ten of these campus libraries had RFID self-help circulation services. The staff and students of these ten campuses were therefore targeted for this study, as these campuses comply with the requirements for libraries having RFID self-help circulation services. The ten campus libraries are the following:

- Cape Town
- Durban
- East London
- Florida
- Johannesburg
- Muckleneuk (Main library)
- Polokwane
- Nelspruit
- Rustenburg
- Sunnyside

The fact that the Unisa Library Services serves an ODeL tertiary academic institution may have an influence on the generalisation of the findings of the study because the other South African tertiary academic institutions are all residential. While Unisa Library Services predominantly serves distance learning users, the other libraries at South African tertiary academic institutions deliver a service to users who visit the campuses more frequently and in many cases daily. The fact that most of Unisa's users are ODeL users may also be a limiting factor, as reaching these users to obtain information during the study might influence the response rate, which in turn may influence the validity and reliability of the results.

During the Unisa ethical clearance process the collection of data became more difficult. Although the researcher was given permission to approach possible participants in South Africa using e-mail, he did not have access to their e-mail addresses. Only the study leader was allowed access to this information and hence sampling was also more difficult as it had to be performed by the researcher in the presence of the study leader.

Obtaining the participant information from the Unisa staff and student databases, while complying with the above-mentioned requirements, was also a cumbersome process. It took nearly three months to get the correct information from Unisa Information and Communications Technology (ICT) because only users visiting Unisa campuses with RFID self-help circulation services could be included for the purposes of the study.

1.6 JUSTIFICATION AND IMPORTANCE OF THE STUDY

By 2016 the Unisa Library Services was the only South African academic library to implement a fully-fledged RFID self-help circulation service. During both implementation and post-implementation, Unisa library staff have learnt valuable lessons. Some of these lessons have relevance for the following:

- Integration of the RFID self-help circulation system with the LMS.
- Identification of the best approach to address project and change management during the implementation of the RFID self-help circulation system.
- The standards to take note of while deciding on which RFID self-help circulation system to choose.
- The factors, best practice, advantages and disadvantages to take note of when choosing and implementing an RFID self-help circulation system.

This study is the first study on the use of RFID self-help circulation services in a South African academic library. It is further unique in the sense that it is also the only study of the influence of best practice, factors and advantages and disadvantages on RFID self-help circulation services in a South African academic library. By studying the experiences of Unisa library staff and users with the RFID self-help circulation services, a valuable contribution could be made regarding such a service to other South African academic libraries. It may also contribute to the compilation of recommendations pertaining to implementation and use of self-help circulation services in South African academic libraries. Hence, the results of this study will in many respects also be applicable to all South African libraries, as the results may be used by the libraries to make decisions on whether or not to implement RFID self-help circulation services.

This is especially important when bearing in mind that implementing an RFID self-help circulation service is costly, both in terms of the committed funds and staff time.

1.7 DEFINITION OF KEY CONCEPTS

User services: O'Sullivan (2010:4–5) defines "the client in an organisation as the main commodity without whom there will be no reason for the organisation to exist. The organisation's services must therefore cater for the user's needs."

In this study, the term "user" was used instead of client, the reason being that "client" points to a relationship between the institution and the person to whom a service is rendered, with the focus on service delivery for monetary gain. The relationship between the institution and a user, on the other hand, suggests a relationship where the focus is not mainly monitory gain.

O'Sullivan (2010:21) defines "service as being about understanding the needs, priorities and expectations of the client."

For the purpose of this study, client (user) services can be defined as all the services that a library delivers to a client (user) and that are focused on the unique needs of the clients or the users of the library.

Open distance electronic learning (ODeL): Kember (2007:8–10) defines open learning, distance education and e-learning as follows:

"Open learning is described as a number of facets of openness, for example open entry, studying anywhere and freedom to study at a time chosen by the student."

"Distance education is defined by a high degree of separation between the teacher and students and in many cases between learners."

"E-learning takes place when teaching and learning can be enabled or facilitated by the use of computers and the Internet."

For the purpose of this study ODeL can be defined as open distance learning where education can take place anywhere over a long distance. Education is facilitated by the use of electronic means, for example WebEx and Big Blue Button sessions, and by making study material available in electronic format. The focus will also be on access to electronic library resources, for example e-books, electronic journals and articles and so forth.

Radio frequency identification (RFID): This is a wireless technology that makes use of radio waves and electronic tags to send and receive data and to identify various objects by manipulating data on the tags. The tags are read by a tag reader in various devices, for example RFID self-issue and self-return machines, sorter machines and staff workstations (Pandian 2010:5–6).

RFID self-help services: Singh, Brar and Fong (2006:24) describe RFID self-help circulation services as "services that allow library users to issue and return library items themselves using radio waves."

For the purpose of this study RFID self-help circulation services can be defined as services that library users can use to issue and return library material themselves with no or limited assistance by staff using RFID technology in libraries.

1.8 LITERATURE STUDY

A literature study was performed by consulting the latest relevant articles and books. In the literature study, the experiences of libraries with RFID self-help circulation services were studied and the following three main trends were identified:

- Best practice that influences the use of RFID self-help circulation services for service delivery to library users
- Factors that influence the use of RFID self-help circulation services for service delivery to library users
- Advantages and disadvantages of using RFID self-help circulation services for service delivery to library users.

The above three trends were considered when compiling the questionnaires and subsequently the recommendations for an effective RFID self-help circulation service. Based on these trends a model was also compiled. Thus the trends were used to establish the factors, best practice, advantages and disadvantages that influence the use of RFID self-help circulation services for service delivery specifically by South African academic libraries.

Some of the best practice identified during the literature study was the following (see Chapter 2, Section 2.2):

Conducting a feasibility study, project management, change management, redesign of the building to cater for RFID equipment, RFID standards and so forth.

Some of the factors to take note of are discussed in Chapter 2, Section 2.3 and include the training of staff and library users, the quality of tagging of library material items, problems with the RFID equipment, users' privacy concerns and so forth.

Various advantages and disadvantages were identified during the literature study (see Chapter 2, Section 2.4). The advantages include, among others, saving time during the self-issue and self-return of items, returning items after hours and the fact that RFID tags make circulation and inventory control easier and faster. Some disadvantages included the cost of RFID equipment and implementation, the visibility of tags and so forth.

1.9 RESEARCH METHODOLOGY

Research methodology is discussed in Chapter 3. The research approach that was followed during the study was a quantitative approach with some qualitative elements. The principle of triangulation was also applied to improve the accuracy of the research results. Accordingly, three different methods of data collection were used.

The research design used was a cross-sectional exploratory case study involving applied research and was of a quantitative nature with some qualitative elements. The case study focused on Unisa Library Services.

The following data collection methods and procedures were used:

- Questionnaires based on the factors, best practice and advantages and disadvantages identified during the literature study.
- Interviews during which library users and specific groups of library staff were targeted and asked closed-ended and open-ended questions.
- Existing statistical documentation analysis which entailed analysing documents pertaining to RFID self-help circulation services usage.

The target population comprised users (students and staff) at Unisa. Stratified systematic sampling was used to make the target population more manageable but still representative. This sampling method was supplemented by using quota sampling owing to the low response rate obtained for online questionnaires.

Data was qualitatively analysed by using MS-Word. Quantitative data analysis was done by using MS-Excel and the Statistical Package for the Social Sciences (SPSS).

The reliability and validity of data were ensured by using sampling, standardised questionnaires, triangulation and pretesting of questionnaires. This is discussed in more detail in Chapter 3, Section 3.8.

Research ethics were adhered to through voluntary participation and informed consent and by ensuring participants' anonymity and confidentiality. This is discussed in more detail in Chapter 3, Section 3.9.

1.10 OUTLINE OF THE STUDY

Chapter 1 discussed the background to the study, as well as the research problem, the aim of the study, the research questions, the scope, the justification for the study, the literature study and the research methodology. It also defined the main concepts and gave an outline of the study.

Chapter 2 deals with the literature study, highlighting three topics in particular pertaining to RFID self-help services: factors, advantages and disadvantages, and best practice. The chapter will include a model based on the three identified topics as input to the survey.

The research methodology, including the research approach, research design, data collection methods and target population and sampling, is dealt with in Chapter 3.

In Chapter 4 the data is analysed using tables and figures.

The interpretation and discussion of the research findings is dealt with in Chapter 5.

Chapter 6 deals with the conclusions and recommendations based on the research findings.

1.11 CONCLUSION

In this chapter the background to the study was discussed, the problem statement was formulated, the aim of the study and objectives were identified, research questions were formulated, the scope was outlined and the justification for the study was also explained.

In the next chapter, a review of the relevant literature regarding RFID technology and RFID self-help circulation services is discussed.

CHAPTER 2

LITERATURE STUDY

2.1 INTRODUCTION

In the previous chapter, the background to the study was discussed. A problem statement was formulated, the aim of the study and objectives were identified, research questions were formulated and the scope was outlined. The justification for the study was also explained.

In this chapter, Chapter 2, the available literature is studied and the key themes are identified.

The review of the literature conducted on RFID self-help circulation services in libraries and, more specifically, academic libraries can be divided into the following themes:

- Best practice that influences the use of RFID self-help circulation services
- Factors that influence the use of RFID self-help circulation services
- The advantages and disadvantages of using RFID self-help circulation services.

2.2 BEST PRACTICE THAT INFLUENCE THE USE OF RFID SELF-HELP CIRCULATION SERVICES

The literature study revealed the following best practice pertaining to the implementation and use of RFID self-help circulation services:

Libraries should conduct a feasibility study during which the cost of both implementing and maintaining the service should be taken into account (Bansode & Desale 2009:3). Madhusudhan (2009:149–150) maintains that the high cost of RFID technology was one of the most significant challenges faced when implementing RFID self-help circulation services at the Law Institute Library and the National Social Science Documentation Centre Library in New Delhi. During the feasibility study, the library should also take into account which components of the RFID self-help circulation services system will be needed to make materials handling more efficient; for example, depending on the size

of the library, is a RFID sorter needed? In addition, the integration of the chosen RFID system with the LMS must also be considered. The feasibility study should also include an investigation into the type of information that will be stored on the RFID tag and possible encryption of the information to cater for privacy issues (Driscoll 2005:91; Howard & Anderson 2005:36; Norwood & Skinner 2012:164). Moreover, libraries should evaluate the available RFID self-help circulation services systems in the light of the needs of both the library and its users (Driscoll 2005:91; Norwood & Skinner 2012:164; Singh & Midha 2008:445).

Project management must be well planned. A project plan with clear timeframes is crucial. To ensure the success of the project, the various roles of all stakeholders in the project must be clearly stipulated (Kieczykowski 2009:10; McDonald 2011:26–28; Sukhula, Chaudhary, & Neeraj 2011:28).

Change management is also a crucial part of such a project. The library must ensure that communication on the planned new RFID self-help circulation services is done on a regular basis to ensure staff and user buy-in (Bansode & Desale 2009:4). The purpose and benefits of the system must also be explained to staff and users. The library's communication strategy should also ensure that staff do not feel that their jobs are threatened by the new technology (Kieczykowski 2009:10–11; Walczyk & Mohamed 2009:5).

Another aspect of change management is the training of the library staff and users in the use of the RFID self-help circulation services. The staff must receive formal training to ensure that they feel comfortable enough with the equipment to in turn be able to train and assist clients in its use.

The efficient redesign of the building to cater for the RFID technology is very important. When making decisions about the design and planning of the space in preparation for the RFID self-help circulation equipment it is important to consult all available stakeholders and experts. The size and shape of the equipment, the number of pieces and the power and network requirements must all be taken into account. The library must also plan the placement of the self-help equipment to ensure that staff will still be able to monitor and assist with usage. All cables should be concealed to keep a professional look and feel (Kieczykowski 2009:10; Singh, Brar & Fong 2006:26).

Integration of the LMS and the RFID software is also crucial and will decide the success of the implementation of the RFID self-help circulation services (Ayre 2012a:15; Pandian 2010:139–140). To ensure successful integration, the LMS must keep up with the development of the RFID software. RFID software or systems and the LMS use specific protocols to enable communication between them. The main protocol is the standard interface protocol (SIP2). If there is a discrepancy between the SIP2 of the LMS and the SIP2 of the RFID software, certain functions will not be available in the LMS although they might be available in the RFID software and vice versa.

Standards are very important in ensuring the effectiveness of RFID self-help circulation services. According to Ayre (2012c:20–26), Howard and Anderson (2005:34), Norwood and Skinner (2012:163) and Singh and Midha (2008:446), the standards necessary for ensuring that different RFID self-help circulation services function in the same way were largely in place by 2012. The US Data Profile document was finalised by the National Information Standards Organisation (NISO) in 2012. This document consists of best practice and standards for US libraries (Ayre 2012c:21-26; Singh & Midha 2008:446). For example, it states that all RFID vendors should use 13.56 MHz as the standard frequency for RFID self-help circulation services. The use of a uniform frequency ensures that different vendor tags function in a standard way. These standards also ensure that the reading of more than one tag at a time is avoided. Moreover, they ensure that the use of RFID self-help circulation services in all relevant processes of libraries is applied in a standard fashion.

The placement of the RFID tags in the best position in books and other library material is another crucial standard. According to Hui and Luk (2013:29–30), the best position to place a tag is as far towards the back of the book and as close to the spine as possible. This standard is important to ensure the most efficient detection of the tags and hence the reading of the information on the tags during self-help circulation and inventory control. Standards are also very important in planning for the future where it might be necessary to incorporate more than one vendor's RFID equipment in a library or if it becomes necessary to change from one vendor to another. If standards are not adhered to, library material may have to be retagged when moving from one vendor to another vendor.

2.3 FACTORS THAT INFLUENCE THE USE OF RFID SELF-HELP CIRCULATION SERVICES

During implementation and post-implementation of RFID self-help circulation services in academic libraries there are a number of factors that influence the success of the implementation and the use of RFID technology. Some of the factors identified in the literature are the following:

Firstly, it is important to cater for efficient and sufficient training of library staff and library users. Secondly, staff roles may change due to the introduction of the new technology. Thirdly, successful tagging of items and good quality tags are imperative if the technology is to be successful (Kieczykowski 2009:10; McDonald 2011:26-28; Sukhula, Chaudhary & Neeraj 2011:28).

Another surprising factor that can have an influence on the successful implementation of RFID self-help circulation services are privacy issues, as indicated by Blansit (2010:352), Caldwell-Stone (2010:39–42), Sukhula, Chaudhary and Neeraj (2011:29) and Walczyk and Mohamed (2009:5). Privacy concerns have been raised by some users when using RFID self-help circulation services in libraries. These include the possibility of tracking the movements of an item and the patron linked to the item. Bansode and Desale (2009:4) found that at the Pune University Library in India users had the perception that patron information was stored on the tag. The truth was that the library only stored the item barcode number and other item information identifying the item on the tag.

The issue around privacy further entails that libraries have an ethical obligation to ensure that any private information, for example library users' reading patterns and activities, is safe-guarded. Pandian (2010:32) points out that RFID technology can be used for identifying objects, transactions and people. This raises the possibility that library users might feel threatened by RFID technology.

According to Butters (2008:201) and Neal (2009:463–465) another important factor that must be taken into account is the user populations of academic libraries. These libraries should focus on delivering a service to their users that meets their needs. Hence, the types of material and services required by these user populations will be important factors when considering the RFID self-help circulation services to use. Butters

(2008:202) found that in academic libraries there has been an increase in the use of electronic resources and a decrease in the use of printed material. If less printed material is available, the impact of implementing RFID self-help circulation services will be limited.

The RFID technology itself can become an important factor when ascertaining the success or otherwise of RFID self-help circulation services implementation. The reliability of the RFID technology and its application in libraries is a factor that needs to be investigated because, if the technology is unreliable, the cost and staff investment will be futile and the RFID self-help circulation services will as a consequence be affected. Other factors to consider include the range within which the RFID system can read the tags effectively, the influence of metal shelves during inventory control and the interference of multiple readers or other non-RFID devices on each other during tag reading. The last mentioned can for example cause an item to be issued to the wrong user (Blansit 2010:351; Caldwell-Stone 2010:39; Pandian 2010:135–139).

The RFID tags and the technology of the RFID tags themselves can be an important factor in deciding the success of these self-help circulation services. One of the biggest constraints on using RFID tags is the visibility of the tags due to their size. This is highlighted by Dawes (2004:11), Pandian (2010:138), Singh and Midha (2008:445) and Sukhula, Chaudhary and Neeraj (2011:28). Tags can be easily removed or vandalised and thus if the tags are also used for security purposes this poses a risk. If the tag is removed, it will mean that the item can be easily removed illicitly from the library as it will not be detected by the RFID security gates. RFID tags can also be easily shielded by using aluminium foil which renders the security feature on the tag useless. The type of tag also influences the effectiveness of the RFID self-help circulation services. Ayre (2012a:9–10) and Blansit (2010:347) indicate that two types of tags are available: active or passive. Active tags have their own power source (battery) which enables them to generate their own signal and hence makes them easier to be detected during inventory control. Passive tags on the other hand do not have their own power source. The choice of tag type can therefore influence the effectiveness of inventory control. According to Gennusa (2008:3), RFID tags are making inventory control easier as it is not necessary to open books to scan a barcode.

According to Pandian (2010:48), there are a number of factors that influence the decision to implement RFID self-help circulation services. These include the following:

- Inefficient use of trained staff
- Need to improve customer service
- Rising labour costs
- Increased material handling time and cost
- Long checkout lines
- Misshelved books
- An unreliable theft-detecting system.

2.4 ADVANTAGES AND DISADVANTAGES OF USING RFID SELF-HELP CIRCULATION SERVICES

In the literature study, the advantages and disadvantages of implementing RFID self-help circulation services were identified. The following authors generally agree on the advantages and disadvantages of RFID self-help circulation services (Ayre 2012b:18; Blansit 2010:351; Butters 2008:200; Caldwell-Stone 2010:39–42; Dawes 2004:9; Driscoll 2005:90; Gheorghe 2011:123; Hadro 2009:2; Howard & Anderson 2005:36; Kieczykowski 2009:10; McDonald 2011:27; Pandian 2010:66-69; Sukhula, Chaudhary & Neeraj 2011:31). The advantages and disadvantages identified by these authors are summarised in the following sections:

2.4.1 Advantages

RFID self-help circulation services enable library users to quickly issue or return items themselves. Therefore, queues at the loan desk are reduced and users also save time (Bansode & Desale 2009:5).

RFID self-help circulation services will lead to a saving in staff time spend on circulation activities, as users will be circulating items themselves (Madhusudhan 2009:150). In addition, staff will be available for assisting and training users with other specialised user needs, for example accessing the library's electronic resources.

The RFID tags make it easier to circulate items, as no barcodes need to be manually scanned. RFID tags also enable more than one item to be checked out simultaneously.

Simultaneous check out and desensitising of the electromagnetic (EM) security strips can also be done.

By using RFID self-help circulation services, the manual handling of material will be reduced. This will lead to a reduction in repetitive motion injuries as the items do not need to be opened for the tag to be scanned. This is possible as no line of sight is necessary as with barcodes.

When using RFID self-help units, there is less chance of errors than when items are handled by library staff. RFID self-help circulation services combine some of the manual processes that reduce the chances of errors occurring.

RFID self-help circulation services make after-hours self-return of items possible (Madhusudhan 2009:152). The items will also be simultaneously returned on the LMS.

Using an RFID sorter reduces the time it takes to sort and shelve items. Incorrect shelving is also reduced because part of the sorting is done automatically by the sorter.

Successful inventory control will lead to improved collection management. Singh and Midha (2008:443) and Sukhula, Chaudhary and Neeraj (2011:28) found that RFID technology enhances the efficiency of inventory control. The same was found by Mandeep, Chuen and Ghazali (2012:236–237) in their description of an inventory control system using RFID technology. Proximity scanning is made possible by the RFID tags; hence, the fact that library material items do not need to be taken off the shelf and opened to scan a barcode makes inventory control easier and faster.

2.4.2 Disadvantages

The cost of the equipment, the staff time allocated during the implementation, the tagging of the collection and the tags themselves are disadvantages that a library must take into consideration.

Tagging of CDs and DVDs can be a challenge, as special RFID tags will be needed. These are expensive and are not as effective as the tags for books.

When using RFID self-help circulation services interference of the RFID signal by other devices, for example cellphone towers and walkie-talkies, might occur. This will lead to the information on the tag not being read correctly or not being read at all.

Although authors generally agree on the advantages and disadvantages discussed above, some authors' opinions differ with regard to the advantages and disadvantages of using RFID tags for securing items against theft. Kieczykowski (2009:9)**,** Norwood and Skinner (2012:163), Singh, Brar and Fong (2006:30) and Sukhula, Chaudhary and Neeraj. (2011:30) all regard RFID security as part of the tags to be an efficient way of securing the collection.

In contrast, Bansode and Desale (2009:6) and McDonald (2011:28) do not regard RFID security as an efficient way of securing the collection. Because the size of the tags makes them highly visible, they can be easily removed or damaged (Bansode & Desale 2009:4; Butters 2008:203; Dawes 2004:11; Driscoll 2005:90; Howard and Anderson 2005:31; Singh and Midha 2008:445). Users may also think the tags have security capabilities even when they are not used for that purpose. This might lead to users removing tags to enable the items to be removed from the library without issuing them. Tags with security capability can be easily compromised by covering the tags with aluminium foil. This can also be done by placing two items against each other with the tags overlaying.

These authors also highlight problems encountered with securing DVDs with specially designed DVD tags. The main problem is the addition of a booster on the security system to identify these special tags; thus, these tags are regarded as expensive and as still posing a risk when securing DVDs.

Ayre (2012a:13) maintains that the advantages and disadvantages of using tags for security purposes are 50:50. On the one hand, the advantages include mainly that the tag in an item can be used simultaneously for circulation purposes and sensitising or desensitising (security). On the other hand, however, she highlights problems for example when a user passes through the RFID security gates with tags that are overlapping or when items are held in a position where the gates might not detect the tags, leading to some of the items not being detected.

The identified factors, advantages and disadvantages and best practice will also be considered during the compilation of the questionnaires and the proposal of recommendations for an effective RFID self-help service.

2.5 MODEL FOR THE STUDY DERIVED FROM THE LITERATURE STUDY

Taking the literature study into account the following model for the study will be used:

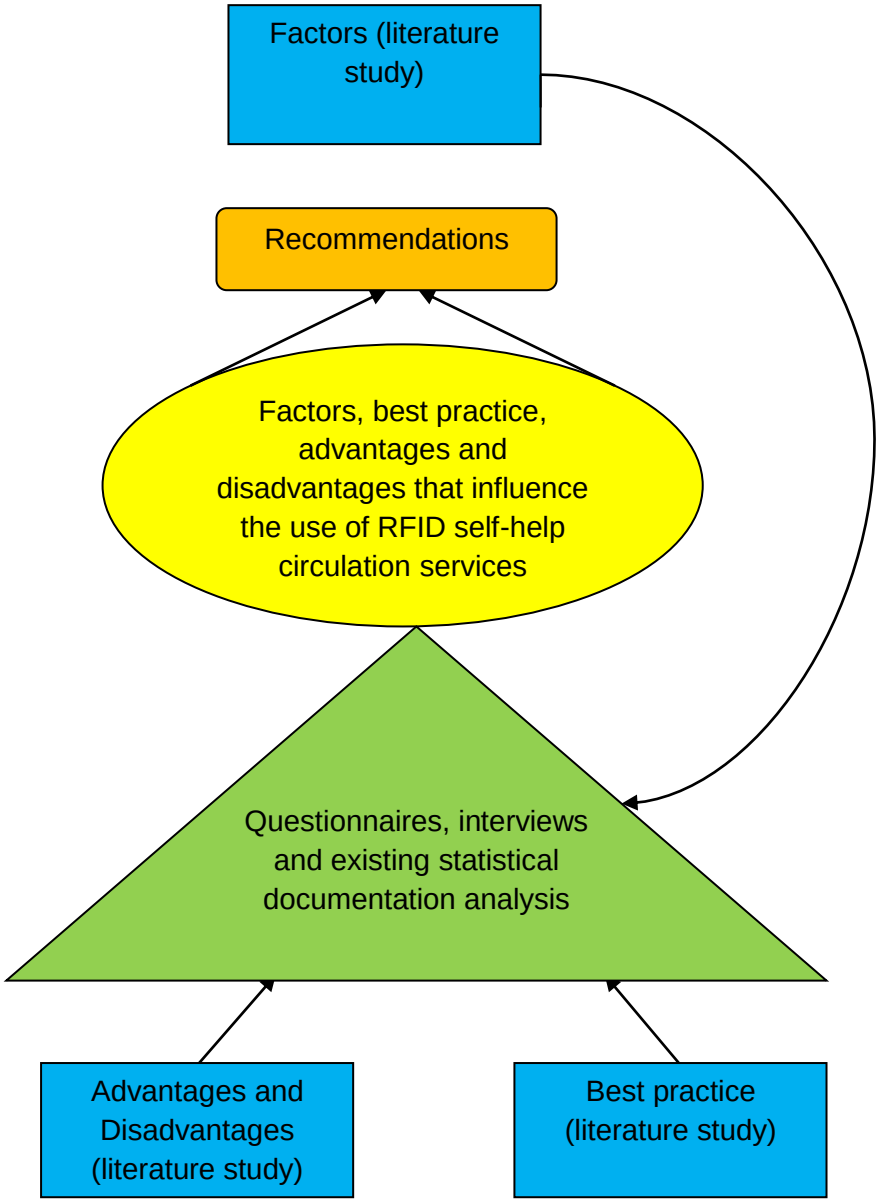

Figure 2.1 Model for the study

The model illustrated in Figure 2.1 shows the factors, best practice, advantages and disadvantages identified during the literature study. These were applied to compile the

questionnaires used to collect information from the respondents both online and during interviews. The literature study was also used to guide the existing statistical documentation analysis. The data obtained from the questionnaires, interviews and the existing statistical documentation analysis were analysed, interpreted and used to compile recommendations.

2.6 CONCLUSION

In this chapter, the review of the literature regarding RFID technology and RFID self-help circulation services were discussed. The focus was on the factors, best practice and advantages and disadvantages that were found in the literature.

In the next chapter the research methodology that was used during the study will be discussed.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

In the previous chapter an overview of the literature on the topic was given. The focus was on identifying factors, best practice, advantages and disadvantages that influence the use of RFID self-help circulation services in academic libraries. A research model was compiled during the literature study.

Chapter 3 will focus on all the aspects related to the research methodology applied in the study.

3.2 THE APPROACH TO THE RESEARCH

During the study, a quantitative methodological approach was applied.

There are three types of approach to research (Neuman 2011:16-17):

- Qualitative approach
- Quantitative approach
- Mixed methods approach

Neuman (2011:174–175) describes qualitative research as “a language of cases and contexts … examine social processes and cases in their social context, and study interpretations or meanings in specific socio-cultural settings”. He emphasises that qualitative research does not take studied social events and convert them into numbers. Babbie (2010:296) and David and Sutton (2011:102) highlight qualitative research as research with the emphasis on the collection of mostly non-numerical data. The data consists of descriptions of events, in-depth interviewing and the use of written or recorded data. Qualitative research also has more of an inductive and exploratory nature. It does not require measures to be set beforehand but rather consists of exploring social processes in their social context. During qualitative research, the researcher will be more open to the ideas of the interviewees or those that will be observed and research questions will be more loosely structured (David & Sutton

2011:83–84). Qualitative research is therefore characterised by constructionism or subjectivism, as the research will focus on the social world consisting of social interaction and the relationships between individuals.

Neuman (2011:193) describes quantitative research as follows: "[it] takes a linear path and emphasises objectivity … will use explicit, standardised procedures and a causal explanation". Quantitative research will usually be of a deductive nature. Therefore, the emphasis will be more on the formulation of a hypothesis and testing of that hypothesis (David & Sutton 2011:84). During quantitative research, the emphasis is on measuring variables in order to enable the generalisation of the findings to scenarios outside the current studied scenario (Lune, Pumar & Koppel 2010:79). Powell and Connaway (2004:3) define quantitative research as a problem-solving approach which is highly structured and consists, where possible, of the measuring and evaluation of concepts. It is also characterised by objectivism and hence quantitative research focuses on the social world as consisting of facts and objects (David & Sutton 2011:85–86).

However, the distinction between qualitative and quantitative research approaches is not always this clear cut. This is illustrated by David and Sutton (2011:84–85) who state that some exploratory research is quantitative while some qualitative research is deductive. Exploratory research is usually associated with a qualitative research approach, while research of a more deductive nature is usually associated with a quantitative approach. They also state that even with quantitative research, the researchers' objectivity might be influenced by their social views of the world. Thus, qualitative and quantitative research approaches can be used to complement each other (Leedy & Ormrod 2013:98). When both qualitative and quantitative research approaches are used it is referred to as a mixed methods research approach.

Johnson and Onwuegbuzie (2004:19–21) identified the following advantages and strengths of quantitative, qualitative and mixed methods approaches to research:

Quantitative research approach

Advantages:

- Testing and validating already existing theories about how and why events occur.

- Testing hypotheses that are created before the data are collected. Research findings can be generalised when the random samples are of sufficient size.
- A research finding can be generalised when it is applied to many different populations and subpopulations.
- Allows quantitative predictions to be made based on the data.
- Cause-and-effect relationships can be assessed more accurately by creating a situation that excludes confusion of many variables.
- Data collection is relatively quick.
- The data obtained are precise and numerical, which lead to less time-consuming data analysis and research results that are relatively researcher independent.
- It is especially useful for research that entails large numbers of people.

Disadvantages:

- The categories and theories that the researcher uses may not correspond with the participants' understanding.
- With the focus on theory or hypothesis testing rather than theory and hypothesis generation, certain aspects might not be included in the research.
- The research results may be too general to be applied directly to specific situations and individuals.

(Johnson & Onwuegbuzie 2004:19)

Qualitative research approach

Advantages:

- The data obtained are related to the participants' own understanding.
- A qualitative approach can describe issues in detail where they occur.
- It is effective for studying a small number of cases in depth and for describing complex issues.

- Cross-case comparisons and analysis can be performed.
- The researcher identifies contextual factors that are applicable to the issues.
- Grounded theory can be used to create a temporary explanatory theory about issues.
- The data are usually gathered in natural environments.
- Researchers will be influenced by changes during the study and will then be able to shift the focus of the study.
- The data are usually provided in the words of participants which enable studying why and how issues occur.
- Such an approach enables the researcher to determine the causes of a particular occurrence.

Disadvantages:

- The results may not easily be generalisable to other people's situations.
- It is difficult to make quantitative predictions.
- Testing of hypotheses and theories is more difficult.
- It may have lower credibility as findings are not based on quantitative data.
- Collection of data takes more time than with quantitative research.
- Data analysis can be time consuming.
- The researcher's biases may influence the results

(Johnson & Onwuegbuzie 2004:20)

Mixed methods research approach

Advantages:

- Qualitative results can be used to further explain quantitative results while quantitative results can add more precision to qualitative results.

- Grounded theory can be generated and tested.
- A broader and more complete range of questions can be answered as more than one approach is used.
- The advantages of one method can be used to address the disadvantages of another method within one study.
- Stronger evidence for a conclusion can be achieved by using the different methods to confirm findings.
- Deeper insights and understanding can be added that might not be possible when only one method is used.
- The generalisability of the results can be increased.

Disadvantages:

- Carrying out both qualitative and quantitative research can be difficult for one researcher.
- The researcher must have a good knowledge of using more than one method together.
- It is more expensive and time consuming than the other approaches on their own.

(Johnson & Onwuegbuzie 2004:21)

The research approach used during the current study was predominantly quantitative in nature with certain qualitative elements. This was achieved to a certain extent by the use of mostly close-ended questions and to lesser extent open-ended questions. Apart from the open-ended questions it should be noted that some of the close-ended questions also allowed for the respondents to elaborate on a yes or no type question.

The reasons for the use of a predominantly quantitative approach were the following:

- Close-ended questions made it possible to obtain short answers from the respondents. The respondents were expected either to choose a Yes or No

answer or to make a choice from a list of possible answers. This would have encouraged respondents to complete the questionnaires as it made completion less time-consuming.

- The mainly numerical data made data analysis faster and easier.
- A quantitative research approach is the recommended approach for large populations. The Unisa population is large and hence a method of fast data collection and analysis was needed.
- It would make generalising of the findings obtained from the sample to the population possible.
- Reliability and validity would be ensured by using random and representative sampling. Validity would also be obtained through the generalisability of the findings.

The principle of triangulation was also applied in the study. Triangulation improves the accuracy of research results by observing from multiple perspectives (Creswell & Zhang 2009:613; Neuman 2011:164). According to Yin (2012:13), triangulation takes place when evidence is confirmed by three different sources.

Triangulation was obtained by using the following three sources of data:

- Questionnaires were used to obtain mainly quantitative information from respondents. Ngulube (2015:137) indicates that questionnaires can be used during qualitative and quantitative research approaches. Questionnaires are therefore not only used during quantitative research approaches. The information from the questionnaires was used to establish the experience of Unisa library users and staff when using RFID self-help circulation services. Some qualitative information was obtained using open-ended questions, while quantitative information was obtained using closed-ended questions. In addition, Likert scale type questions were included that assessed the respondents' views on, for example, the ease of use of RFID self-help circulation services. Questionnaires were made available online to library users (students and staff) by sending a link to the questionnaires to potential respondents via e-mail.

- Interviews were also used to obtain information from Unisa library users and staff regarding their experiences with the RFID self-help circulation services. During the interviews, the same questionnaires were used as those distributed by e-mail and completed online.

- Existing statistical documentation analysis may be used to analyse and interpret documented statistics (Neuman 2011:368–370). Quantitative information in the form of circulation statistics reflecting the use of RFID self-help circulation services was obtained in this way. The statistics are readily available from statistical documents compiled on a monthly basis by the Unisa Library Services.

This was also confirmed by Ngulube (2005:136) and Ngulube (2015:137), who refers to methodological triangulation which entails using multiple methods of data collection. Accordingly, the methods that were triangulated during the current study were the questionnaires, the interviews and the existing statistical documentation analysis.

3.3 RESEARCH DESIGN

Mouton (2001:56) maintains that the research design focuses on the kind of study that is planned and the aim of the study. For this study, the aim identified in Chapter 1, Section 1.3 was taken into account. The research design is a general research plan that should start with a research problem or question (Leedy & Ormrod 2013:2; Mouton 2001:56; Saunders, Lewis & Thornhill 2012:158-159; Singleton & Straits 2005:64) and thus the research questions explained in Chapter 1, Section 1.4 were considered. The research design used was the following:

- A cross-sectional exploratory case study of a predominantly quantitative nature

- Applied research.

This research design will now be explained:

The study took the form of a case study focusing on one South African academic library, or case. The chosen library was the Unisa Library Services. According to Mouton (2001:149), “case studies are studies that are usually qualitative in nature and that aim to provide an in-depth description of a small number (less than 50) of cases”. Ngulube (2015:135) argues that a case study can be quantitative and/or qualitative in nature. His

research on research methodology used in knowledge management articles found that 21% of the studied articles used a case study as part of a quantitative approach. Hence, case study research does not need to be limited to a qualitative research approach only. This is confirmed by Neuman (2011:42), who indicates that most case study research is qualitative but does not necessarily need to be. Lune, Pumar and Koppel (2010:81, 374–375) also found that case study research can be strengthened by quantitative methods such as surveys and even the use of statistics. This opinion is confirmed by David and Sutton (2011:168), as they indicate that during case studies it is useful to carry out quantitative data collection and analysis. They maintain that the research questions will also determine the emphasis in a case study, that is, whether it will be quantitative and/or qualitative. One example they mention is a case study conducted by the Harvard Business School in which both quantitative and qualitative data were collected to study success and failure in companies.

During the current study, use was made of questionnaires mainly to obtain quantitative information and, to a lesser extent, qualitative information. Interviews were also used to obtain information and specific documents in the form of statistical reports compiled by the Unisa Library Services were consulted as well. The statistics from these documents were used to obtain and analyse quantitative information on the use of RFID self-help circulation services. Additionally, the literature study identified the factors, best practice and advantages and disadvantages pertaining to RFID self-help circulation services, which were used to inform the compilation of the questionnaires.

Reasons for using a case study are the following:

- Lune, Pumar and Koppel (2010:374) highlight one of the advantages of case study research as the fact that it offers an opportunity to triangulate multiple methods during research. This ensures the validity and reliability of the results.

- Hyde, Ryan and Woodside (2012:6) mention generalisation as another important reason for using case study research. This means that by using this research the results can be generalised from a single or small number of cases. In the current study, it meant that the results that were obtained by using Unisa Library Services as a case study can be used to assist academic libraries in the RSA to

make decisions regarding the implementation and use of RFID self-help circulation services for service delivery.

- Case study research can also be used to create theory (Neuman 2011:42). During this research, the results led to theory being produced on the factors, best practice and advantages and disadvantages pertaining to RFID self-help circulation services.

The study was furthermore a cross-sectional study. Neuman (2011:44) describes cross-sectional research as research that "gathers data at one time point and creates a kind of snapshot of social life". The case study research conducted during the current study was cross-sectional as it obtained information at a specific point in time but on various issues (the factors, best practice and advantages and disadvantages that influence RFID self-help circulation services). The current study gathered information at a specific time on the experiences of Unisa Library clients and staff with RFID self-help circulation services.

The case study research in the current study was moreover an exploratory study. Babbie (2010:92) indicates that a great deal of social research is conducted to explore a topic or to become familiar with a relatively new topic. David and Sutton (2011:84–85) maintains that quantitative research can also be exploratory in nature. This study explored the factors, best practice and advantages and disadvantages that influence the RFID self-help circulation services as identified in the literature study by using questionnaires, interviews and existing statistical documentation analysis to obtain information related to the issues.

The extent of the study was further determined by the fact that it was applied research. Applied research makes it possible to assist in decision-making about practical problems (Leedy & Ormrod 2013:27). This fits with the proposed research objective where the results were used to assist academic libraries in South Africa to make decisions regarding the implementation and use of RFID self-help circulation services for service delivery.

3.4 DATA COLLECTION METHODS AND PROCEDURES

The methods that were used to collect data during the study were questionnaires, interviews and existing statistical documentation analysis.

3.4.1 Questionnaires

Babbie (2010:255) describes questionnaires as instruments that are designed specifically to obtain information that will be used for analysis.

The questionnaires for the current study were compiled by using the LimeSurvey tool supplied by Unisa ICT. LimeSurvey is an online survey tool that is used to create and publish online questionnaires. The questionnaires were structured, which means that they consisted of specific questions which were formulated beforehand and listed in the same order for all respondents (Lune, Pumar & Koppel 2010:200; Powell & Connaway 2004:147; Singleton & Straits 2005:221–222).

Questions can be either closed-ended or open-ended (Babbie 2010:256; David & Sutton 2011:252–253). With closed-ended questions the respondent is required to choose from a range of answers (Lune, Pumar & Koppel 2010:199; Powell & Connaway 2004:128; Singleton & Straits 2005:237). This type of question enables the respondent to supply an answer quickly. Respondents will therefore be more willing to complete a questionnaire with predominantly closed-ended questions. Coding of answers to closed-ended questions is easier and simpler than open-ended questions. A disadvantage of closed-ended questions can be the possible exclusion of options, however this can be countered by including an option where respondents can enter their own opinion (Babbie 2010:256; David & Sutton 2011:253). With open-ended questions, the respondent is required to give their response in their own words (Powell & Connaway 2004:128; Singleton & Straits 2005:237). Thus coding of open-ended responses is more time-consuming. Open-ended questions also require respondents to have sufficient interest in and knowledge of the question posed (Babbie 2010:256; David & Sutton 2011:253). The majority of the questions in the questionnaires were closed-ended, although some made provision for further elaboration by the respondent depending on the choice made.

Links to self-administered online questionnaires were sent to targeted users via an e-mail. These were subsequently completed and submitted online. David and Sutton (2011:243–244) list the main advantages of self-administered online questionnaires as the low costs involved and the fact that a large sample of respondents can be easily reached and interviewer bias is limited. The rationale for using self-administered online questionnaires was because the sample of Unisa students and staff were geographically widespread. The main disadvantages are the possible low response rate and the fact that there is no one available to assist with questions that the respondent may not understand (David & Sutton 2011:243–244).

The following questionnaires were used:

- A questionnaire to obtain and analyse information from Unisa library users (staff and students) regarding their experience with the use of the RFID self-help circulation services. The information was used to assess problems experienced, the factors and best practice contributing to service delivery and factors limiting service delivery. Advantages and disadvantages were also surveyed.
- A questionnaire to obtain and analyse information from Unisa circulation librarians at remote campus libraries, that is, not the Muckleneuk campus. The purpose of the questionnaire was to obtain information from the circulation librarians' perspective and not from a library user's perspective. The use of RFID equipment reserved for use by circulation librarians was also included in this questionnaire.

The information was obtained in accordance with the aim identified in Chapter 1, Section 1.3:

> To establish the factors, best practice and advantages and disadvantages that influence the use of RFID self-help circulation services for service delivery by South African academic libraries with specific emphasis on the Unisa Library.

The use of questionnaires enabled the researcher to attain the following objectives:

- Identify the factors that have an influence on the effectiveness of RFID self-help circulation services in academic libraries

- Identify best practice for the implementation of RFID self-help circulation services in academic libraries
- Identify the advantages and disadvantages of implementing RFID self-help circulation services in academic libraries
- Compile recommendations to be considered before a library decides to implement RFID self-help circulation services.

3.4.2 Interviews

Interviews enable a researcher to obtain information by recording oral responses from respondents in a social setting. During interviews, the interviewer assists the interviewee to grasp the researcher's intent when asking the questions (Babbie 2010:274; Neuman 2011:341).

The interviews used during the current study were structured interviews in terms of which specific questions were formulated beforehand and then put to all the respondents in the same order (Lune, Pumar & Koppel 2010:241; Powell & Connaway 2004:147; Singleton & Straits 2005:221–222). In the interviews, all the interviewees were asked the same questions to ensure consistency. Misinterpretation of questions by the interviewees was limited as the interviewer could clarify any misunderstanding that might have arisen (Neuman 2011:242).

During the interviews, specific structured questionnaires were used depending on the target group of interviewees. These questionnaires were also compiled using LimeSurvey. The questions posed during the interviews were both closed-ended and open-ended. Closed-ended questions require the interviewee to choose from a range of answers (Powell & Connaway 2004:128; Singleton & Straits 2005:237) and enable he or she to answer quickly. Interviewees will therefore be more willing to answer closed-ended questions. Subsequent coding of the answers to these questions is also easier and simpler. A disadvantage of closed-ended questions can be the possible exclusion of options but this was countered by including an option where respondents could give their own opinion (Babbie 2010:256; David & Sutton 2011:253). With open-ended questions, the respondent is required to give their response in their own words (Powell & Connaway 2004:128; Singleton & Straits 2005:237), and thus coding of open-ended

responses is more time-consuming. Such questions also require respondents to have sufficient interest in and knowledge about the topic of the question (Babbie 2010:256; David & Sutton 2011:253). The majority of the questions were closed-ended and hence the answers were predominantly quantitative in nature.

Although structured questionnaires were used, interviews were still conducted instead of handing the questionnaires to the participants for self-completion. This ensured that the interviewer could still clarify the meaning of the questions if necessary. Interviews were possible due to the proximity of the participants. Participants were approached for interviews at Muckleneuk, Sunnyside and Florida campuses.

The following interviews were conducted:

- Unisa staff and student library users were interviewed to establish how they experienced the use of RFID self-help circulation services. During the interviews, the same online questionnaires that were distributed to staff and student library users by e-mail, were used. Staff and students from the Florida, Sunnyside and Muckleneuk campuses were interviewed. These interviews were not formally scheduled; rather respondents were approached individually in each of the three libraries using the quota sampling method. Prospective interviewees were approached separately and asked to participate voluntarily.

- Unisa Muckleneuk circulation librarians were interviewed regarding their experiences with the RFID self-help circulation services while assisting library users. The use of RFID equipment reserved for use by circulation librarians was also included in this questionnaire. The same online questionnaire that was sent to circulation librarians at remote campus libraries was used.

- Interviews were held with Muckleneuk library shelving staff regarding their use of the RFID sorter machine and RFID staff workstation.

- Interviews were held with Muckleneuk library acquisitions staff responsible for tagging of library material items with the RFID conversion stations.

- Interviews were conducted with Muckleneuk library delivery staff responsible for the despatch and receipt of library postal collection items.

- Interviews were also held with the library staff responsible for inventory control of library material.

These above-mentioned interviews with library staff were conducted as follows:

A specific interview questionnaire, customised for staff from each library section, was compiled using LimeSurvey. As the interviews were voluntary and some staff members had indicated they did not want to participate, all staff were approached separately and the voluntary nature of participation was emphasised. The interviews were scheduled for half an hour each.

Interviews were also conducted with systems librarians of the library technology services section (LTS) and Unisa Library Services senior management. These interviews were conducted as follows:

- Muckleneuk systems librarians responsible for library technology services are also responsible for the technical support for the RFID self-help circulation services' equipment and software, as well as the RFID equipment and software used only by the library staff. A specific questionnaire was compiled for the interviews using LimeSurvey. Interviews were scheduled by approaching each system librarian separately and emphasising the voluntary nature of the study. At the time of the study only three systems librarians were working in the LTS section, one of whom was the researcher, hence only the remaining two systems librarians were interviewed. Interviews were scheduled for half an hour each.
- A questionnaire specifically for senior management was compiled using LimeSurvey for the interviews. Interviews were scheduled by approaching all senior management staff members for an interview, once again emphasising the voluntary nature of the interviews. It was felt to be important to interview all the senior management staff as they have all been involved in some way or other in both the implementation and post-implementation RFID self-help circulation services processes. Interviews were scheduled to last half an hour each.

3.4.2.1 Pre-testing the questionnaires

It was important to pre-test the questionnaires to make sure that the questions were well structured and clear and to avoid inconsistencies (Babbie 2010:267; Lune, Pumar &

Koppel 2010:199–200). Babbie (2010:267) maintains that it is not essential to give the pre-test questionnaires to a representative sample but the questionnaires should at least be relevant to the recipients. The online self-administered questionnaires and the questionnaires used during the interviews were pre-tested.

The various questionnaires were pre-tested as follows:

- Questionnaires for Unisa staff and students as library users: two staff members and three students were approached randomly in the Muckleneuk library for this purpose.
- Questionnaires for Unisa circulation librarians as the library staff members assisting library users: two librarians in the Muckleneuk library were approached randomly to pre-test the relevant questionnaire.
- Questionnaires for library shelving staff: one library staff member was approached in the Muckleneuk library.
- Questionnaires for acquisitions tagging staff: one library staff member was approached in the Muckleneuk library.
- Questionnaires for library delivery staff: one library staff member was approached in the Muckleneuk library.
- Questionnaires for inventory control staff: one library staff member was approached in the Muckleneuk library.
- Questionnaires for LTS systems librarians: one systems librarian was approached in the Muckleneuk library.
- Questionnaires for senior management of Unisa Library Services: one library staff member was approached in the Muckleneuk library.

The interviews eventually led to the attainment of the following objectives:

- Identify the factors that have an influence on the effectiveness of RFID self-help circulation services in academic libraries

- Identify best practice for the implementation of RFID self-help circulation services in academic libraries
- Identify the advantages and disadvantages of implementing RFID self-help circulation services in academic libraries
- Compile recommendations to be considered before a library decides to implement RFID self-help circulation services.

3.4.3 Existing statistical documentation analysis

Neuman (2011:368–370) describes existing statistics as a form of information about the social world that is already available in statistical documents. Statistical information on the use of the RFID self-help circulation services was obtained from the Unisa Library Services' circulation statistical documentation. The statistical information was readily available from the monthly Unisa Library Services circulation statistics. The statistics were used to indicate what percentage of the circulation statistics were part of the RFID self-help services usage and which were part of the circulation at the manual circulation desk. These statistics would contribute to establishing the value of the RFID self-help circulation services.

To interpret the statistics a reasonable percentage of the RFID self-help circulation services usage at Unisa Library Services expressed as a percentage of total circulation had to be established. To do this, three surveys from the literature study were identified for this purpose:

In a survey of the RFID self-help circulation services at the San Bernardino Public Library, Kiezykowski (2009:9) found that self-help use amounted to 75% of the total self-help circulation six months after implementation.

In a 2012 international survey, Ayre (2012a:12) found that 35% of the respondents indicated 85% or higher self-help usage.

Meanwhile McDonald (2011:28–29) found that after the implementation of a RFID self-help circulation service at Crandall Public Library, 65% self-help usage was reported for 2009. Subsequently, after some changes had been made, self-help circulation usage rose to 75% in 2 months and by 2011 it had reached 81%.

With the above three cases in mind it was possible to calculate a fair percentage of the circulation of Unisa Library RFID self-help usage to be used as a criterion of expected RFID self-help circulation. Using an average of the above cases, it was assumed that expected RFID self-help circulation use should have been 75% at the time of the study.

The document analysis assisted in attaining the following objective:

- Identify the factors that have an influence on the effectiveness of RFID self-help circulation services in academic libraries
- Identify best practice for the implementation of RFID self-help circulation services in academic libraries
- Identify the advantages and disadvantages of implementing RFID self-help circulation services in academic libraries
- Compile recommendations to be considered before a library decides to implement RFID self-help circulation services.

3.5 TARGET POPULATION AND SAMPLING

According to Neuman (2011:246), Reaves (1992:94) and Singleton and Straits (2005:113–115), a target population is the specific collection of elements that will be studied. In the case of this study, it was the Unisa staff and students and the various relevant categories of library staff. However, that is a large population and sampling was thus necessary to redefine the target population.

3.5.1 Sampling

Sampling was discussed extensively. The main reason for this is the fact that two types of sampling had to be used. The main type was stratified systematic sampling that was supplemented by quota sampling. This was due to a low response rate on the self-administered online questionnaires.

A sample is a small set of cases a researcher selects from a large pool and generalises to the population (Alreck & Settle 2004:55; Neuman 2011:240; Rea & Parker 2014:135; Reaves 1992:94–95). Sampling should be used where the population that will be targeted by the surveys is too large.

No sampling was necessary for studying the existing circulation statistics. The data was obtained by using the existing statistical documentation analysis of monthly circulation statistics kept by Unisa Library Services staff and included in reports.

During sampling, certain factors will affect the accuracy of sampling:

A key factor during sampling is *measures of central tendency*. Measures of central tendency provide a number that represents what is typical or average for the data collected during the study (Rea & Parker 2014:99). An important measure of central tendency is the mean. The *mean* is the mathematical centre of the data or average (Rea & Parker 2014:105). It takes into account the relative distance of the data from the centre. This means that the data is distributed evenly or at regular intervals on both sides of the mean or midpoint (Rea & Parker 2014:106).

Another key factor during sampling is the *standard deviation*. The standard deviation is determined by the distance of the sample mean from the population mean (David & Sutton 2011:532). The greater the distance, the greater the standard deviation will be. This means that the lower the standard deviation, the more closely the data will be represented by the mean (Rea & Parker 2014:111–112; Reaves 1992:86). This also means that the more heterogeneous a population is the larger the sample that will be necessary. Hence, homogeneous populations may have smaller samples (Singleton & Straits 2005:140–141).

The *level of confidence* affects the accuracy of sampling. This is the risk of error that will be acceptable when determining the sample size. According to Alreck and Settle (2004:61), this is an indication of the probability that a value in the sample will be within a specific range from the same value in the population. A researcher will usually accept either a 95% level of confidence or a 99% level of confidence. A 95% level of confidence will represent a 5% chance of error, while a 99% level of confidence will represent a 1% chance of error (Babbie 2010:206; Rea & Parker 2014:163–164).

The *confidence interval* also affects the level of sampling accuracy. As already discussed, the relative distance of the data from the mean or centre will determine sampling accuracy. The smaller the difference of the data intervals from the mean, the better the accuracy of the sample will be (David & Sutton 2011:533; Rea & Parker

2014:163–164). The more accurate a sample, the smaller the confidence intervals will be (Alreck & Settle 2004:62).

All these factors will make it easier to generalise the research results from a specific sample to a larger population (Rea & Parker 2014:143). The closer the sample mean is to the population mean, the more accurate the sample size will be (Alreck & Settle 2004:62; Rea & Parker 2014:164).

Taking the above factors into account the following formula is proposed by Rea and Parker to establish the sample size (2014:167–170):

$$n = \frac{Za^2[p(1-p]N}{Za^2\,[p(1-p)] + (N-1)MEp^2}$$

Where:

n = sample size

Za = the score for various levels of confidence. For a confidence level of 95% it will be 1.96 (Babbie 2010:206; Rea & Parker 2014:167). A 95% confidence level was used for the purpose of this study.

p = the standard error of the sample proportion or interval. This is related to how accurately the sample mean reflects the population mean. This is known as the confidence interval. However, this is not known. Therefore Rea and Parker (2014:167) recommend setting the confidence interval at .5 so as to give the highest sample size.

N = total population.

MEp = the margin of error in terms of proportions. The margin of error is usually set between 3 to 5% to correspond with a 95% level of confidence (Rea & Parker 2014:169-170). For the purpose of the current study it was set at 3% or .03.

Sampling was applied as follows:

The total population of Unisa staff was too big to be targeted and thus a representative sample had to be obtained, of which the results could be applied to the bigger population of Unisa staff. At the time of the sampling process the available statistics indicated there was a total of 4 236 staff members at Unisa. Staff were grouped in the following categories (Unisa 2015):

Table 3.1 Sampling of staff users per category

Staff sampling				
Staff user categories	**Total**	**Sample**	**Interval**	**Random starting point**
Instructional/research professional	1 481	620	2	1
Executive/management professional	116	116	1	1
Specialised/support professional	171	171	1	1
Technical	19	19	1	1
Non-professional admin	2 268	725	3	2
Crafts/trades	118	118	1	1
Service workers	63	63	1	1

The staff data obtained from the Human Resources (HR) database was limited to staff from the ten campuses with RFID self-help circulation services. The data was supplied by Unisa Information and Communications Technology (ICT). These campuses were:

- Cape Town
- Durban
- East London

- Florida
- Johannesburg
- Muckleneuk
- Nelspruit
- Polokwane
- Rustenburg
- Sunnyside

As part of the sampling the researcher also tried to include contract workers. However, Unisa ICT could not extract contract staff data from the contract payment database which contains most of the contract worker data because they could not identify the staff categories and limit the data to contract workers from the ten relevant campuses. Despite this, the data from the HR database did include fixed term contract staff and tutors.

The total population of Unisa students was also too big to be targeted. The same was therefore true for students as for staff and hence representative sampling was necessary. At the time of the sampling process the available statistics indicated that there was a total of 387 731 Unisa students. They were grouped per college (Unisa 2015):

Table 3.2 Sampling of students per college

Colleges	Total	Sample	Interval	Random starting point
CAES	7 814	939	8	6
CEDU	57 602	1048	54	4
CEMS	63 156	1 049	60	12
CHS	40 344	1 040	38	8

Table 3.2 (cont.) Sampling of students per college

Colleges	Total	Sample	Interval	Random starting point
CLAW	31 989	1033	30	14
CSET	18 410	1009	18	3
CAS	26 861	1 111	24	9

The data obtained from the student database was also supplied by Unisa ICT and was limited to students from the ten above-mentioned campuses with RFID self-help circulation services.

According to Alreck and Settle (2004:62–63), a sample should contain a minimum of at least 100 respondents and a maximum of not more than 1 000 respondents. They indicate that samples should also not be larger than 10% of the population. They emphasise that the maximum size of a sample has nothing to do with the size of the population. The example they use is: if a person wants to taste whether a bowl of soup is hot enough, a spoonful of soup is adequate. This was confirmed by Bryman (2001:95-97), who maintains that the absolute size of a sample is more important than the relative size. Therefore, a probability sample of 1 000 participants across Great Britain would have the same validity as a sample of 1 000 participants across the USA even though the population of the USA is larger than that of Great Britain. He further states that samples larger than 1 000 participants will not mean any noticeable gain in validity.

However, for the current study it was decided to use the formula proposed by Rea and Parker (2014:167–170) to calculate the sample size. This formula makes provision for levels of confidence, confidence intervals and standard deviation. The samples in the above tables for staff and students were calculated by using their formula. Where a staff category had a total population of fewer than 100 or just more than 100, it was decided to use the total population as the sample.

After the sample size is calculated, it is necessary to decide which elements to include in the sample. The method of sampling best suitable to this study was stratified systematic sampling. Sampling was done as follows:

Babbie (2010:215) suggests that by using stratification, you can ensure representative sampling across a heterogeneous population that is divided into homogeneous groups within the population. For this study, the sampling frames of the total population from which the sample was drawn were the staff and the student databases of Unisa. A sampling frame is therefore a complete list of the members of a group in the population from which a sample is selected (Babbie 2010:208; Saunders, Lewis & Thornhill 2012:262). Stratification of staff and students was based on division into the above staff categories and student colleges respectively. By using further stratification, students were divided into homogeneous groups per college according to undergraduate, postgraduate, diploma and certificate students. Babbie (2010:215) reasons that by using stratification a list can be compiled of a heterogeneous population by including all the homogeneous groups in a sampling frame. Systematic sampling can then be done across all listed groups. This will lead to a valid and representative sample as long as there is no possibility of only including elements from the population with only one variable. An example from the current study is when every 30th student in the College of Law (CLAW), across the four groups in the college (undergraduate, postgraduate, diploma and certificate) will not only include male and no female students. In the current study, the student data was listed per college in the four homogeneous groups. Within each of the four groups, the students were listed in no specific order and no indication of gender. Therefore, by using systematic sampling per college across all four of the different homogeneous student groups, a valid representative sample was obtained.

Systematic sampling entails the calculation of a sampling interval (Neuman 2011:252). Accordingly, an interval was used to randomly select a sample from the population in accordance with the sample size. This was done by compiling the list of students per college by listing undergraduates together and then postgraduates and so on. The interval was then used to calculate the students per college and per student category, for example undergraduates, to be included in the sample. A representative sample was obtained this way across the different student categories thus ensuring representativeness not only per college but also per student category. For staff, the

same principle was applied by compiling a list of staff per staff category. The interval was then used to calculate the staff to be included in the sample for each staff category.

To calculate the interval (n) the following formula was used (Alreck & Settle 2004:79–80):

n = frame size ÷ sample size

The frame size in the case of staff was the total per staff category. The sample size for each staff category was calculated as discussed and indicated in Table 3.1. Similarly, the frame size in the case of students was the total students per college and the sample size for each college was calculated as discussed and indicated in Table 3.2.

Systematic sampling was also used to choose a random starting point from the table (an Excel spreadsheet) for, for example, the student frame. Thus a random starting point was used for each college list. Babbie (2010:213) maintains that a random starting point helps to ensure that a valid sample is chosen. According to Alreck and Settle (2004:80), the random starting point should be calculated by using the interval. For staff, the random starting point was calculated using the interval indicated in the above staff table except in the case of staff categories with an interval of one, where the random starting point was one because all staff in those categories were included in the sample (see the staff table for the random starting point). For students, the random starting point was calculated by using the indicated interval in the above student table (see the student table for the random starting point).

Alreck and Settle (2004:80) state that various methods can be used to calculate the random starting point. Examples include using a bingo device, numbered balls and suchlike. The method that was chosen was the following:

For the two staff categories with samples of 1 000 or more the specific interval was used. Accordingly, the numbers one to two and one to three respectively were written on separate pieces of paper and a random number was drawn for each staff category to choose the random starting point. For students, the random starting point was calculated using the specific interval of each college. For example, for the College of Education (CEDU) the numbers 1 to 54 were written on separate pieces of paper and a random number was drawn to choose the random starting point. A random starting point

for the two indicated staff categories and for each college was chosen by applying the principle individually. In this way different random starting points were established for each staff category and college. From the random starting point the interval was used to choose the sample participants.

The staff from different sections of the library who were involved with assisting users of RFID self-help circulation services or who used the RFID equipment meant for staff use were also approached. Sampling for library staff was done as follows:

- All ten Muckleneuk circulation librarians were approached for interviews because some staff members indicated they did not want to participate. In the end, interviews were conducted with seven circulation librarians.
- All 58 Unisa Library Services circulation librarians at the remote libraries were approached for interviews. However, many of these staff members did not want to participate. Eventually, of the questionnaires emailed to these staff, seventeen were completed.
- All 26 Muckleneuk library shelving staff were approached regarding their use of the RFID sorter machine but some indicated they did not want to participate. Eventually interviews were conducted with ten of these staff.
- All four Muckleneuk acquisitions library staff responsible for tagging of library material items were approached for interviews. Interviews were conducted with all four.
- All five Muckleneuk library delivery staff responsible for despatch and receipt of library postal collection items were approached for interviews but some did not want to participate. Interviews were eventually conducted with three staff members.
- Both Muckleneuk systems librarians responsible for library technology services were approached and interviews were conducted with both.
- All three Muckleneuk library staff responsible for inventory control of library material were approached and interviews were conducted with all three.

- All six Unisa Library Services senior management were approached for interviews. All senior management staff members were approached. They had all been involved in the RFID self-help circulation services implementation and post-implementation processes from the perspective of their specific responsibility areas. Interviews were subsequently conducted with all six.

3.6 LOW RESPONSE RATE

Another factor that may influence the sample size and hence the interval to be chosen is the non-responsive bias. Alreck and Settle (2004:62–63) and Bryman (2001:97) found that there is a low response rate for online questionnaire respondents, which may affect the validity and reliability of the research results (Ngulube 2005:136–137). To counter this, where a staff category had a total population of less than 100 or between 100 and 200, it was decided to use the total population as sample. For students, the actual sample sizes per college were used.

However, a low response rate was achieved even after resending the questionnaires three times. Hence, to cater for the low response rate, it was decided to supplement the responses received with an additional sampling method; that of quota sampling. Quota sampling entails dividing the population into groups. Then a decision is made on a pre-determined number of participants from the population groups by expressing the proportion of each group as a percentage of the population (Babbie 2010:194–195). This was applied as follows:

Library users were approached randomly and their participation requested on a voluntary basis at the Muckleneuk, Sunnyside and Florida campus libraries. Using the quota sampling method, the students were divided into undergraduate and postgraduate categories. Certificate and diploma students were included in the undergraduate category for this purpose. Based on the total number of students per college the number of undergraduates and postgraduates was individually determined as a percentage of the total per college. So, the percentage of undergraduates for a specific college was expressed as a proportion of 100. The number of 100 were chosen because Alreck and Settle (2004:62–63) indicate that no fewer than 100 participants should be part of a sample. The same was done to determine the proportion of postgraduates. For staff, the proportion of 100 for both academic staff and non-

academic staff was determined the same way. After calculation, the quotas were as follows:

Table 3.3 Quota percentage for academic and non-academic staff

Quota percentage		
	% Academic	% Non-academic
Quota % (100% total)	35	65
Total responses received	58	113

The quota for staff for quota sampling included UNISA staff who were also students. It was also decided to use the total non-academic and academic staff responses rather than the quota proportion to take advantage of a larger response rate.

Table 3.4 Quota percentage for undergraduate and postgraduate students per college

Quota percentage						
	College of Accounting Sciences		College of Agriculture and Environmental Sciences		College of Economic and Management Sciences	
	% Undergrad	% Postgrad	% Undergrad	% Postgrad	% Undergrad	% Postgrad
Quota % (100% total per college)	76	24	77	23	88	12
Total responses received	43	8	15	4	92	20

Table 3.4 (cont.) Quota percentage for undergraduate and postgraduate students per college

Quota percentage						
	College of Education		College of Human Sciences		College of Law	
	% Undergrad	% Postgrad	% Undergrad	% Postgrad	% Undergrad	% Postgrad
Quota % (100% total per college)	94	6	86	14	94	6
Total responses received	70	9	75	22	62	4

Table 3.4 (cont.) Quota percentage for undergraduate and postgraduate students per college

Quota percentage		
	College of Science Engineering and Technology	
	% Undergrad	% Postgrad
Quota % (100% total per college)	92	8
Total responses received	55	7

After the interviews with students the quotas in Table 3.4 could not be reached for all colleges. The responses received from undergraduate and postgraduate students for

the College of Economic and Management Sciences (CEMS) were more than the calculated quotas. The postgraduate responses for the College of Education (CED) and the College of Human Sciences (CHS) were also more than the quotas. Thus, in this case, the total student responses for these colleges were used to take advantage of a larger response rate.

3.7 DATA ANALYSIS

The data obtained from the questionnaires were analysed as follows:

3.7.1 Quantitative data analysis

David and Sutton (2011:471) describe quantitative data analysis as having five stages:

1. Getting to know your data – during which the different variables are explored and trends identified.
2. Explore relationships and differences in the data – during which differences and similarities are described between the cases within a variable.
3. Making conclusions about estimates relating to the population.
4. Predicting outcomes by taking into consideration all the different variables.
5. Data manipulation – during which changes are made to the research data to enable the best analysis of the data to be done.

During the current study, the data was first studied and then cleaned to ensure that there were no errors. Patterns were identified from the data and the data was then divided into categories. Where the data was not already available as numbers, data had to be coded into numbers. Coding was done by assigning codes consisting of characters that represented certain elements within the different variables. The data was then further analysed by investigating the frequency count of cases for each variable. An example is to take the variable *gender* and to do a frequency count; this entails calculating the number of males and females, which can be coded as 1 for male and 2 for female (David & Sutton 2011:473–475). To keep track of the meaning of the different codes, a code book was created that included explanations of the codes (Denscombe 2010:253–255; Saunders, Lewis & Thornhill 2012: 483). Where Excel was

not sufficient, the data obtained from the quantitative survey was analysed by using SPSS (Statistical Package for the Social Sciences). Quantitative data from the questionnaires and the interviews was analysed using SPSS 24.

3.7.2 Qualitative data analysis

Although the data was predominantly quantitative, some qualitative data was collected, which was subsequently studied by reading it and analysis patterns were identified. To understand and better explain the information gathered, coding was used (Lune, Pumar & Koppel 2010:322–326). The process used to code is called content analysis, during which the data is transformed from text to code by analysing the text. Coding serves to summarise, interpret and categorise the data. Coding firstly entails creating descriptive codes that are open to change, which is known as open coding. As the coding process progresses associations between the codes are sought and codes grouped together – this is known as axial coding. Selective coding is then used to focus only on the key or most important codes. Qualitative data analysis also included a comparative method which entailed coding and categorising the raw data and comparing the codes and categories with the data throughout the coding process (Denscombe 2010:115–116). The qualitative data obtained from the open-ended questions was further analysed using tables in MS-Word.

3.8 ENSURING RELIABILITY AND VALIDITY

Reliability and validity are obtained by ensuring that one measures what one intends to measure (Singleton & Straits 2005:91). In the current study, reliability and validity were assured in the following ways:

Reliability and validity were attained using sampling as this ensures the selection of a representative and valid sample from the population (Lune, Pumar & Koppel 2010:81–82). Ngulube (2005:132–133) maintains that a random representative sample will ensure the reliability and validity of research results. The systematic sampling method chosen ensured a random and representative sample, as the sample participants were chosen from different colleges (students) and from each of the different staff categories. However, owing to the poor response for the online self-administered questionnaires, the researcher had to supplement the responses obtained by using quota sampling during the interviews. Because quota sampling is not seen as the best way to ensure a

representative sample, in this study representivity, and hence reliability and validity, were affected to a certain extent. David and Sutton (2011:19–20) argue that validity is also obtained by ensuring the generalisability of the research results from the sample to the population. In the current study, this was done by defining the population from which the sample was chosen as Unisa students from all colleges and staff from all staff categories.

To ensure that reliable data was obtained, standardised questionnaires were distributed to all participants who had been identified randomly during the sampling process. The questions included in the questionnaires were concise and clear to prevent any misinterpretation and were mostly closed-ended although a few open-ended questions were also included. Lune, Pumar and Koppel (2010:199) indicate that closed-ended questions are easier to tabulate but it is often helpful to include an open-ended question or two at the end to encourage additional comments. With closed-ended questions a single answer in the form of a selection from a number of alternatives is expected, while a descriptive answer is expected from open-ended questions.

By using different methods for collecting data, for example questionnaires, interviews and existing statistical documentation analysis, it was possible to ensure that the research was approached from different angles thus ensuring the validity and reliability of the research results. This method for approaching research is referred to as triangulation (Neuman 2011:164–165). When deciding on the different data collection methods, the researcher made sure that they aligned with the aim of the research and the objectives, thus assuring reliability and validity.

Another method for ensuring the reliability and validity of the research results was to pre-test the questionnaire to screen out errors in the questionnaire that might influence the respondents' interpretation of the questions (Babbie 2010:267).

3.9 RESEARCH ETHICS

During research it is important to ensure that ethical issues are taken into consideration. Voluntary participation means that all participants will be informed fully about the purpose of the research and what it will be used for (Babbie 2010:66; Saunders, Lewis & Thornhill 2012:241). In the current study, informed consent was obtained from all participants by indicating to all Unisa students and staff targeted in the sample that

approval for the research had been obtained from the institution where the research was done and supplying them with the details of the research.

A further aspect of ethics is anonymity. Babbie (2010:67) and Saunders, Lewis and Thornhill (2012:242) describes anonymity during research as ensuring that the participant cannot be identified by anyone. During this study, links to the questionnaires were e-mailed to respondents, who were required to complete the questionnaires online but they were not required to put their names on the questionnaires. Participants' anonymity was also assured during the interviews in the way in which the questionnaires were compiled.

Confidentiality was guaranteed by reassuring the respondents that their replies and their information would not be made public, for example a specific respondent's income (Babbie 2010:67).

Participants in the current study were protected by the Unisa policy on research ethics (Unisa 2012), which covers the ethical aspects discussed in this section.

3.10 CONCLUSION

This chapter discussed the research design, the research approach and the data collection methods that were used, namely, questionnaires, interviews and existing statistical documentation analysis. Methods of sampling and data analysis and issues relating to research ethics were also discussed. The research design of the study was aligned to the objectives of the research. It was assumed that if the objectives were achieved, a meaningful research contribution would result, specifically with regard to making recommendations that could be used by libraries considering the implementation of RFID self-help circulation services.

The next chapter will discuss the analysis of the data that was obtained by using the research design mentioned here.

CHAPTER 4

ANALYSIS AND PRESENTATION OF THE DATA

4.1 INTRODUCTION

In the previous chapter an overview of the research methodology was given. A predominantly quantitative research approach was followed and the principle of methodological triangulation was applied. The data collection methods that were triangulated during the current study were questionnaires, interviews and existing statistical documentation analysis. The research design comprised a case study with a specific focus on Unisa Library Services and the sampling methods used included stratified systematic sampling supplemented with quota sampling. Quantitative and qualitative data analyses were discussed.

Chapter 4 focuses on an analysis of the data obtained after applying the data collection tools. The analysis was guided by the objectives and research questions identified in Chapter 1, Section 1.4.

The literature study was used to firstly identify factors, best practice and the advantages and disadvantages that influence the RFID self-help circulation services in academic libraries. These factors, best practice and advantages and disadvantages were then applied to Unisa Library Services by analysing the data that was obtained with the above-mentioned data collection tools. During data analysis, additional factors, best practice and advantages and disadvantages specific to Unisa Library Services were also identified.

During data analysis SPSS 24 was used to calculate the Pearson correlation coefficient between two variables. The null hypothesis was also tested. This means that the correlation between two variables in the sample is hypothetically equal to zero or does not exist in the population (Kirkpatrick & Feeney 2013:76–79). Applicable variables analysed in Section 4.9 to Section 4.12 were further analysed by using the Pearson correlation method.

An example of a correlation table is the one calculated for Section 4.9.3.2, Table 13:

Correlations

		Use self-issue	Change management
Use self-issue	Pearson Correlation	1	.866**
	Sig. (2-tailed)		.000
	N	800	800
Change management	Pearson Correlation	.866**	1
	Sig. (2-tailed)	.000	
	N	800	800

**. Correlation is significant at the 0.01 level (2-tailed).

The variables between which the Pearson correlation coefficient was calculated in the above table were *change management* regarding self-issue library users and *self-issue usage*. The Sig. or significance level of the two chosen variables in each case during data analysis is 0.000. N = the sample. Depending on which of the rest of the variables in this chapter were chosen either *satisfaction* or *usage* was used as the second variable to calculate the correlation.

The Pearson correlation method of analysis indicates if the correlation between two variables in the sample will also exist in the population (Alreck & Settle 2004:305-306). In the above example the correlation between the two variables exists in the sample and the population.

With a correlation significance level of 0.000 between the two variables, this number is rounded off and is less than 0.0005 or 0.05%. This means that the chance of the population correlation being zero is less than 0.05%. With a Sig. value of 0.000 the risk of error is one in a 1 000. It must also be noted that if the correlation is significant at a 0.01 level, it will also be significant at the 0.05 level (Antonius 2013:218-219).

A significant correlation between two variables means that a change in one variable will lead to a change in the other variable. So, covariance or how much two variables go together is indicated (Babbie 2010:95; David & Sutton 2011:519-520; Neuman 2011:404).

4.2 RESPONDENTS TO THE STUDY QUESTIONNAIRES AND INTERVIEWS

Questionnaires and interviews were used to obtain information from the sample group. As discussed in Chapter 3, Section 3.6 problems were encountered with obtaining a representative sample. The respondents were classified into users of the Unisa Library Services and staff members of Unisa Library Services. The former was divided into three groups:

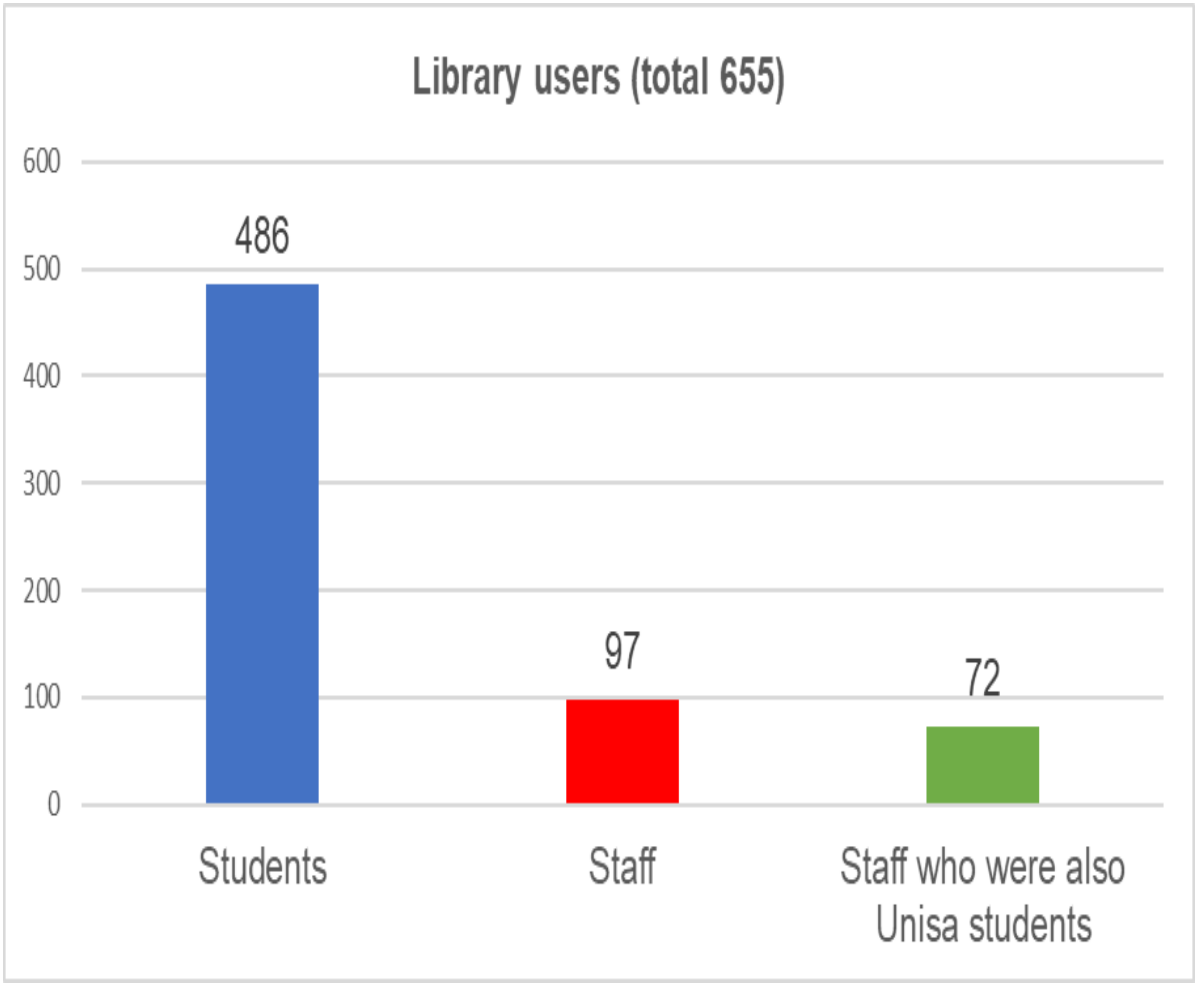

Figure 4.1 Total of library user respondents

Library staff members were also targeted during the study, using questionnaires and interviews. The staff members who were part of this study were the following:

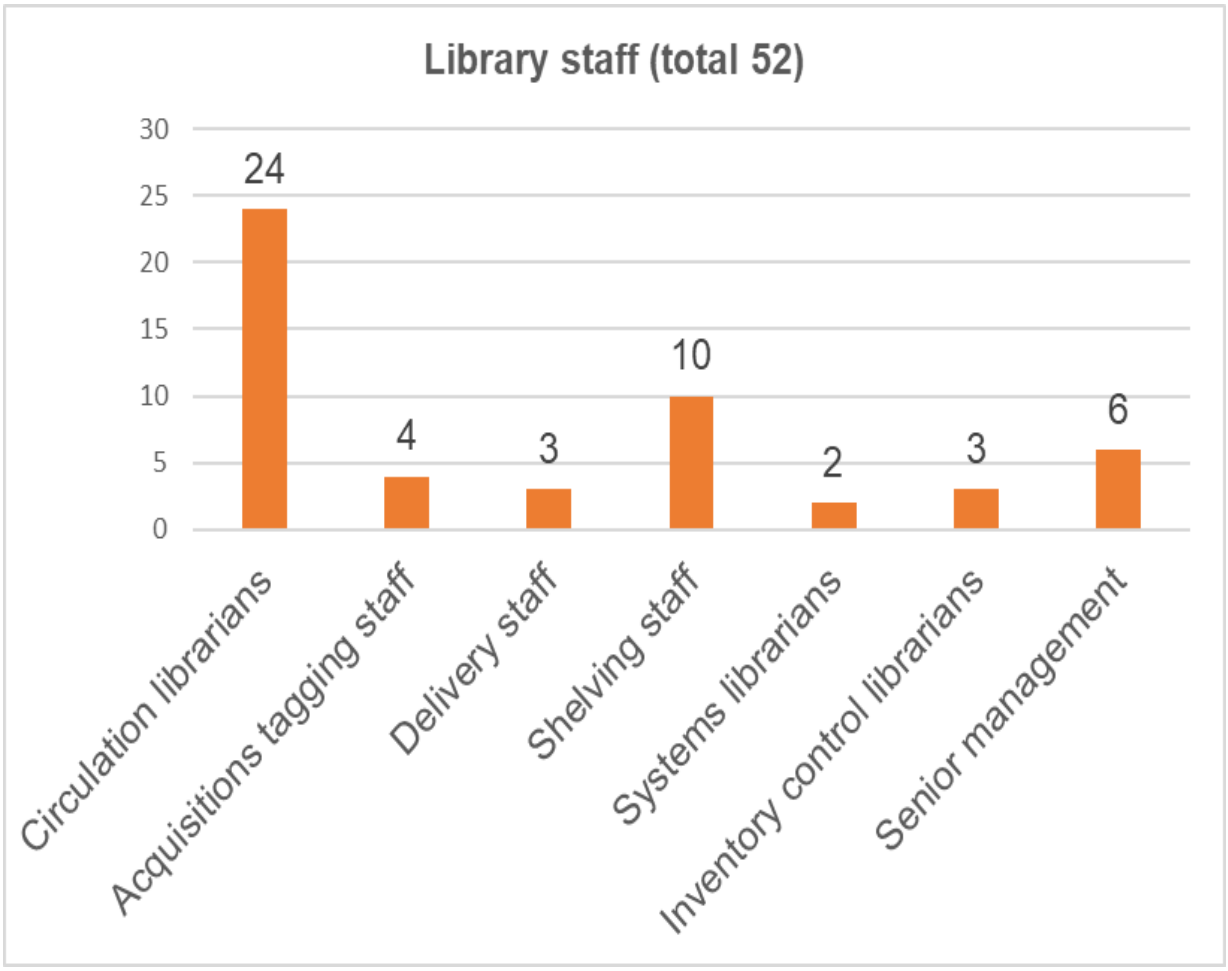

Figure 4.2 Total of library staff member respondents

Responses from both the library staff and the users were obtained by using the relevant questionnaire for each library section and library user category as follows:

- Library users identified during stratified systematic sampling were targeted by sending links to the online questionnaire in e-mails. Interviews were also conducted with the library users identified as part of the quota sampling. The same self-administered online questionnaire for library users was also used during the interviews. The data obtained related to the library users' experience with the RFID self-help circulation services and was mostly quantitative in nature with some qualitative elements.

- Interviews were conducted with circulation librarians at the Muckleneuk branch library. Circulation librarians who assisted library users on a daily basis using RFID self-help circulation services were targeted. The data collected in these interviews was quantitative in nature with some qualitative elements.

- An online questionnaire was send to circulation librarians at the remote Unisa Library Services branches. Circulation librarians who assisted library users daily using RFID self-help circulation services were targeted. E-mails with links to the relevant online questionnaire were sent to the identified branch librarians. The data obtained by using these self-administered online questionnaires was quantitative in nature with some qualitative elements.

- Acquisitions tagging staff based at the Muckleneuk library were interviewed and data relating to the tagging of library material items was captured. The questions in these interviews were quantitative in nature with some qualitative questions.

- A round of interviews was also conducted with delivery staff based at the Muckleneuk branch library. During the interviews data relating to the use of RFID staff workstations was captured. The questions in these interviews were quantitative in nature with some qualitative elements.

- Interviews were also conducted with shelving staff based at the Muckleneuk branch library. During the interviews, specific questions were asked regarding the number of library items found without RFID tags, items found where the information on the tags could not be read by the RFID equipment, and items where the tags had been removed or damaged. Questions were also posed regarding the use of the RFID sorter machine and staff workstation. The data collected during these interviews was quantitative in nature with some qualitative elements.

- Interviews were further conducted with the systems librarians in the library technology services section (LTS). The data captured related to the systems librarians' experience during maintenance and support of the RFID equipment and the integration of the equipment with the LMS. The data obtained during these interviews was mostly qualitative with some quantitative elements.

- Inventory control librarians based at the Muckleneuk branch library also were targeted for interviews. Questions were posed regarding the use of the RFID technology for inventory control. The data obtained during these interviews was qualitative in nature with some quantitative elements.

- Senior library management was also interviewed. The data obtained was related to management issues regarding the RFID self-help circulation services. The data collected during these interviews was mostly qualitative in nature with some quantitative elements.

The questionnaires that were used are attached in Annexure 1. Individual questionnaires for the different library sections had to be drawn up, as each section uses the RFID technology in a unique way. Combining questionnaires would have led to confusion in answering the questions.

4.3 RFID SELF-HELP CIRCULATION VERSUS THE MANUAL CIRCULATION DESK

Implementation of the RFID self-help circulation services started mid-2010 and was finalised by the beginning of 2011. Circulation statistics have been kept since January 2011 to track the usage of the manual circulation desk versus the RFID self-help circulation services.

To establish whether implementation of the RFID self-help circulation services led to reduced use of the manual circulation desk at the Unisa Library Services a comparison was made. Accordingly, statistics for the period January to December 2011 are shown in Figure 4.3:

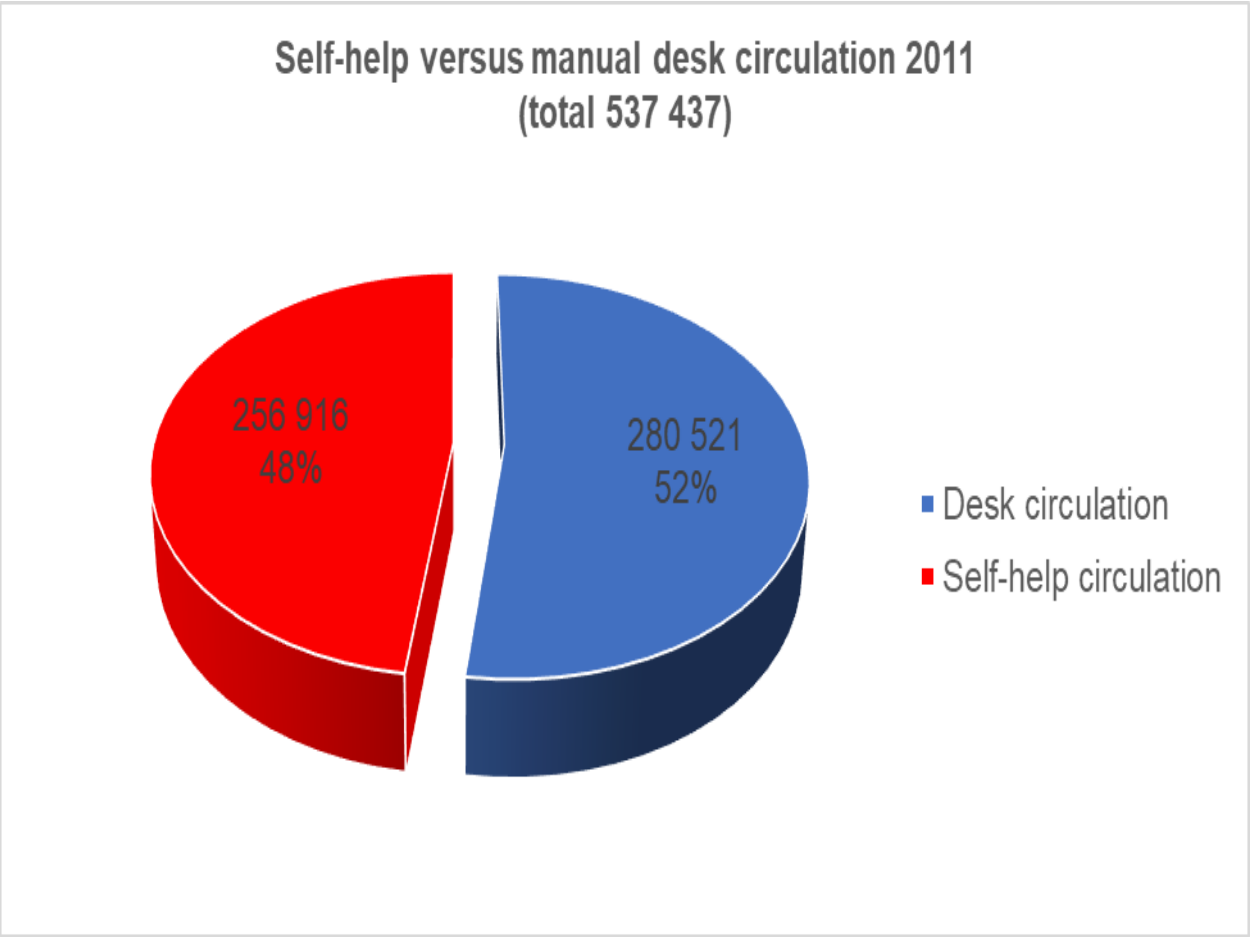

Figure 4.3 Comparison of manual desk and RFID self-help circulation for January – December 2011

A further comparison between the manual circulation desk and the RFID self-help circulation statistics for the period January – December 2015 was also made (see Fig. 4.4):

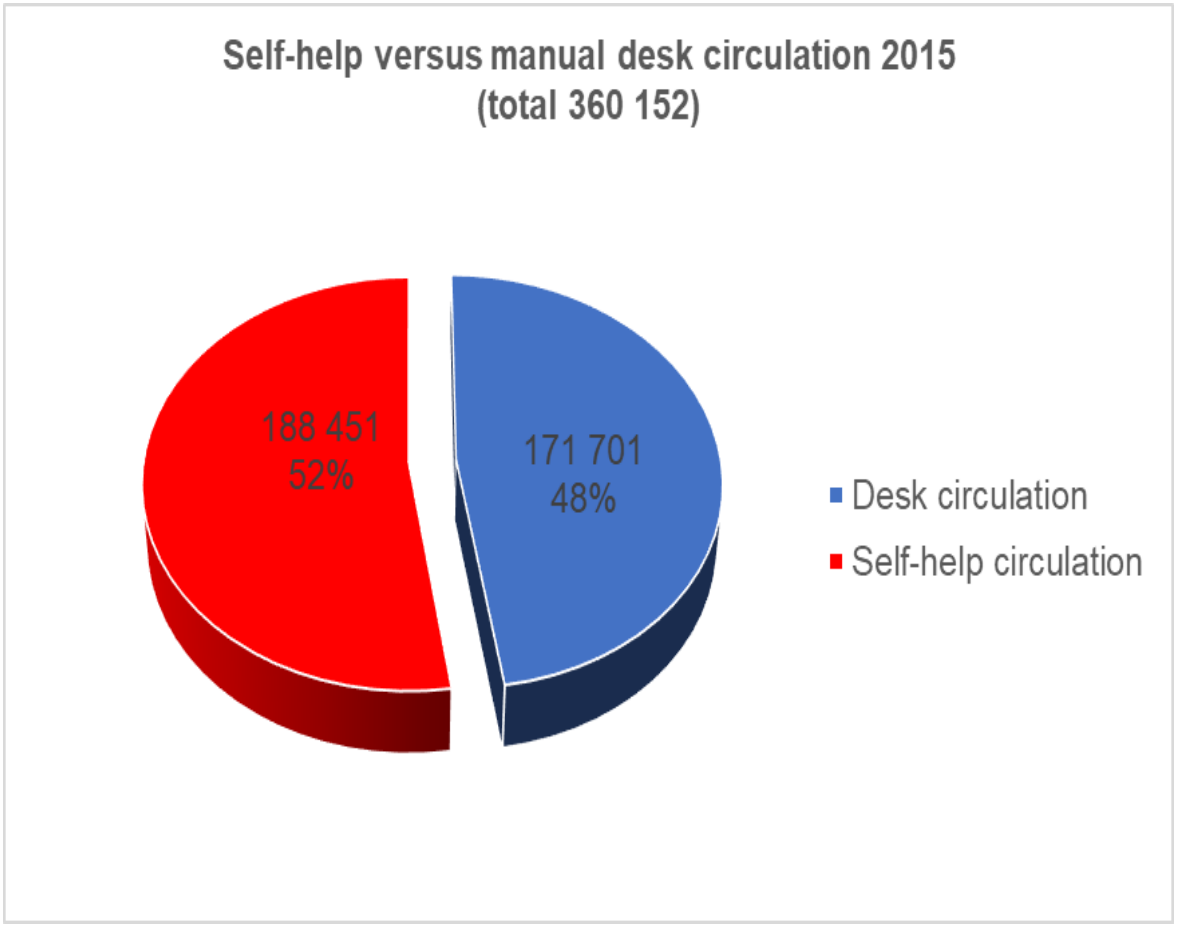

Figure 4.4 Comparison of manual desk and RFID self-help circulation for January – December 2015

From the above two figures, it is clear that during the first year (2011) of the RFID self-help circulation services implementation at Unisa Library Services, use of the manual circulation desk exceeded that of the RFID self-help circulation services: 52% as opposed to 48%. By 2015, however, the use of the RFID self-help circulation services compared to the use of the manual circulation desk had reversed, with 52% of RFID self-issue and self-return circulation by users visiting Unisa libraries versus 48% of manual issue and return using the circulation desk. However, according to the three articles (see Chapter 3, Section 3.4.3) that describe the use of RFID self-help circulation services, self-help circulation should raise to approximately 75% of total circulation after six months to two years of implementation. This was not the case after more than five years of RFID self-help circulation services being in use at Unisa Library Services. Therefore, this is an indicator of the presence of factors, best practice and advantages and disadvantages having an influence on the RFID self-help circulation services.

4.4 USE OF THE RFID SELF-HELP CIRCULATION SERVICES BY LIBRARY USERS

The use and non-use of the RFID self-help circulation services by the different categories of library user respondents were as follows:

Table 4.1 Use and non-use of RFID self-help circulation services by library users

Library user category	**Use and non-use**					
	Issue		**Total**	**Return**		**Total**
	Yes	**No**		**Yes**	**No**	
Students	222 (45.68%)	264 (54.32%)	486 (100%)	189 (38.89%)	297 (61.11%)	486 (100%)
Staff	60 (61.86%)	37 (38.14%)	97 (100%)	57 (58.76%)	40 (41.24%)	97 (100%)
Staff who were also Unisa students	46 (63.89%)	26 (36.11%)	72 (100%)	42 (58.33%)	30 (41.67%)	72 (100%)

Student respondents who did not use the self-issue services exceeded those that did – 264 (54.32%) versus 222 (45.68%). In addition, 297 (61.11%) did not use the self-return services as opposed to 189 (38.89%) students who did.

60 (61.86%) staff users used the self-issue services versus 37 (38.14%) who did not, while 57 (58.76%) staff users used the self-return services versus 40 (41.24%) who did not.

Use of the self-issue services by staff who were also Unisa students were as follows: 46 (63.89%) used the self-issue services while 26 (36.11%) did not.

42 (58.33%) of this user category used the self-return services versus 30 (41.67%) who did not.

4.5 FREQUENCY OF USE OF THE RFID SELF-HELP CIRCULATION SERVICES

Frequency of use of the RFID self-help circulation services was also studied because it is an indicator of the presence of factors, best practice and advantages and disadvantages that have an influence on these services. The more or less often the services were used indicates that certain factors, best practice and advantages and disadvantages were present that influenced how often the services were used.

The Pearson correlation was calculated between the variables *frequency of use* and *satisfaction with use* of the self-help circulation services for library users. The significance of the correlation was calculated and found to be at the 0.01 level between Table 4.2 to 4.3 below – *frequency of use* and Table 4.4 to Table 4.6 – *satisfaction with use*.

4.5.1 Frequency of use of the RFID self-issue services

Library user respondents who used the RFID self-issue services were asked to indicate how often they used them. The results are illustrated in Table 4.2 below:

Table 4.2 Frequency of use of the RFID self-issue services

Library user category	**Frequency of use**				
	Once a week	**More than once a week**	**Once a month**	**More than once a month**	**Once every quarter**
Students	33 (14.86%)	23 (10.36%)	43 (19.37%)	34 (15.32%)	37 (16.67%)
Staff	1 (1.67%)	2 (3.33%)	10 (16.67%)	4 (6.66%)	19 (31.67%)

Table 4.2 (cont.) Frequency of use of the RFID self-issue services

Library user category	Frequency of use				
	Once a week	**More than once a week**	**Once a month**	**More than once a month**	**Once every quarter**
Staff who were also Unisa students	2 (4.35%)	1 (2.17%)	8 (17.39%)	4 (8.7%)	16 (34.78%)

Table 4.2 (cont.) Frequency of use of the RFID self-issue services

Library user category	Frequency of use						
	Twice a year	**Once every 9 months**	**Once a year**	**Other frequencies**		**No answer**	**Total**
				Once	**Twice in 3 years**		
Students	17 (7.66%)	5 (2.25%)	28 (12.61%)	1 (0.45%)	1 (0.45%)	0	222 (100%)
Staff	12 (20%)	6 (10%)	6 (10%)	0	0	0	60 (100%)
Staff who were also Unisa students	8 (17.39%)	2 (4.35%)	4 (8.7%)	0	0	1 (2.17%)	46 (100%)

The highest number of student respondents were found in the frequency category "Once a month" – 43 (19.37%) and the lowest with frequencies of "Once" – one (0.45%)

respondent. One (0.45%) student respondent had a frequency of use of twice in three years. 19 (31.67%) was the highest number of staff whose frequency of use was “Once every quarter” and one (1.67%) was the lowest number of staff whose frequency of use was “Once a week”. The frequency of use with the highest number of staff who were also Unisa students was in the category “Once every quarter” with 16 respondents (34.78%), and the lowest number of respondents fell into the category “More than once a week” with one respondent (2.17%). One respondent in this user category did not answer the question.

4.5.2 Frequency of use of the RFID self-return services

Library self-return user respondents were asked to indicate how often they used the RFID self-return services. The results are given in Table 4.3 below:

Table 4.3 Frequency of use of the RFID self-return services

Library user category	**Frequency of use**					
	Once a week	**More than once a week**	**Once a month**	**More than once a month**	**Once every quarter**	**Twice a year**
Students	14 (7.41%)	9 (4.76%)	48 (25.4%)	29 (15.34%)	28 (14.81%)	24 (12.7%)
Staff	2 (3.5%)	0	9 (15.78%)	4 (7.01%)	19 (33.33%)	11 (19.29%)
Staff who were also Unisa students	4 (9.52%)	0	7 (16.67%)	4 (9.52%)	12 (28.57%)	7 (16.67%)

Table 4.3 (cont.) Frequency of use of the RFID self-return services

Library user category	Frequency of use						
	Once every 9 months	Once a year	Other frequencies			No answer	Total
			Once	Twice in 3 years	Once every 2 months		
Students	5 (2.65%)	29 (15.34%)	1 (0.53%)	1 (0.53%)	1 (0.53%)	0	189 (100%)
Staff	5 (8.77%)	8 (14.03%)	0	0	0	0	57 (100%)
Staff who were also Unisa students	2 (4.76%)	6 (14.29%)	0	0	0	0	42 (100%)

The highest number of student respondents fell in the frequency category “Once a month” – 48 (25.4%) and the lowest with frequencies of “Once”, “Twice in three years” and “Once every 2 months”. There was one (0.53%) respondent in each of the latter three frequency categories. 14 (24.56%) was the highest number of staff whose frequency of use was “Once every quarter” and zero was the lowest number of staff whose frequency of use was “More than once a week”. The highest frequency of use for staff who were also Unisa students was in the category “Once every quarter” with 12 respondents (28.57%) and the lowest number of respondents fell into the category “More than once a week” with zero respondents.

4.6 SATISFACTION WITH THE USE OF THE RFID SELF-HELP CIRCULATION SERVICES

Satisfaction with the use of the RFID self-help circulation services needed to be investigated as it is another indicator of the presence of factors, best practice and

advantages and disadvantages that have an influence on RFID self-help circulation services. The degree of satisfaction experienced when using these services means that there are certain factors, best practice and advantages and disadvantages present that influence the services.

4.6.1 Library users' satisfaction with use of the RFID self-issue services

The library user respondents who indicated that they used the RFID self-issue services were asked how satisfied they were with them. As described in Chapter 3, Section 3.2, a Likert scale was used with 1 being "Not satisfied at all" and 5 being" Very satisfied". The results are displayed in Table 4.4 below:

Table 4.4 Library users' satisfaction with use of the RFID self-issue services

Library user category	**Rating on Likert scale**					
	1	2	3	4	5	Total
Students	6 (2.7%)	14 (6.31%)	56 (25.23%)	70 (31.53%)	76 (34.23%)	222 (100%)
Staff	2 (3.33%)	6 (10%)	17 (28.33%)	24 (40%)	11 (18.34%)	60 (100%)
Staff who were also Unisa students	1 (2.17%)	3 (6.52%)	12 (26.09%)	17 (36.96%)	13 (28.26%)	46 (100%)

As seen in Table 4.4, 76 (34.23%) students rated their use of the self-issue services as "Very satisfied". In comparison only six (2.7%) student respondents rated the use of the self-issue services as "Not satisfied at all". A combined total of 146 (65.76%) student respondents rated their satisfaction with use as 4 or 5 on the Likert scale. The combined total of student respondents that rated satisfaction with use as 1 or 2 was 20 (9.01%), while the number of student respondents who was neutral about the question was 56 (25.23%).

11 (18.34%) staff members rated their use of the self-issue services as “Very satisfied”, while only two (3.33%) respondents rated their use of the self-issue services as “Not satisfied at all”. The combined total of staff respondents that rated satisfaction with use as 4 or 5 was 35 (58.34%), while on the other hand the combined total of staff respondents who rated satisfaction with use as 1 or 2 was eight (13.33%). The number of staff respondents who was neutral was 17 (28.33%).

13 (28.26%) staff members who were also Unisa students rated their use of the self-issue services as “Very satisfied” and only one (2.17%) respondent rated the use of the self-issue services as “Not satisfied at all”. The combined total of respondents that rated satisfaction with use as 4 or 5 was 30 (65.22%), while the combined total of staff respondents that were also Unisa students that rated satisfaction with use as 1 or 2 was four (8.69%). The number of staff respondents that were neutral on the issue amounted to 12 (26.09%).

When the combined total of 4 and 5 ratings is taken into consideration it is clear that far more respondents in all three user respondent categories were satisfied with the use of the self-issue services than those who were not.

4.6.2 Library staff’s satisfaction with use of the RFID self-issue services

Both the circulation librarians responsible for assisting library users with the use of the RFID self-issue circulation services and the systems librarians were asked how satisfied they were with the self-issue services. The systems librarians had to indicate their satisfaction based on their experience during support and maintenance of the self-issue services and the integration of the equipment with the LMS. A Likert scale was used in this regard, with 1 being “Not satisfied at all” and 5 being” Very satisfied”. The results are shown in Table 4.5 below:

Table 4.5 Library staff's satisfaction with use of the RFID self-issue services

Library staff category	**Rating on Likert scale**						
	1	2	3	4	5	No answer	Total
Circulation librarians	0	0	5 (20.83%)	9 (37.5%)	7 (29.17%)	3 (12.5%)	24 (100%)
Systems librarians	0	0	1 (50%)	1 (50%)	0	0	2 (100%)

Seven (29.17%) circulation librarians rated their satisfaction with the use of the self-issue services as "Very satisfied", while none rated the use of the self-issue services as "Not satisfied at all". The combined total of respondents who rated their satisfaction with use as 4 or 5 was 16 (66.67%), while the combined total of circulation librarians who rated their satisfaction with use as 1 or 2 was zero. The number of circulation librarian respondents who was neutral numbered five (20.83%). Three circulation librarians did not answer the question.

When the combined total of 4 and 5 ratings is taken into consideration it is clear that, like the library users of the self-issue services, circulation librarians experienced the self-issue services as largely satisfactory.

One (50%) systems librarian respondent rated satisfaction as 4 and one rated satisfaction as three. Hence, the majority of systems librarian respondents were satisfied with no respondents indicating non-satisfaction, while 50% rated satisfaction as neutral.

Even though 50% of systems librarian respondents was neutral regarding satisfaction, the remaining 50% of respondents rated satisfaction as 4 with no respondents rating satisfaction as 1 or 2.

4.6.3 Library users' satisfaction with use of the RFID self-return services

The respondents that indicated they used the self-return services were posed the question how satisfied they were with the use of the self-return services. A Likert scale was used with 1 being "Not satisfied at all" and 5 being" Very satisfied". The results are below:

Table 4.6 Library users' satisfaction with use of the RFID self-return services

Library user category	**Rating on Likert scale**						
	1	2	3	4	5	No answer	Total
Students	3 (1.59%)	6 (3.17%)	41 (21.69%)	49 (25.93%)	86 (45.5%)	4 (2.12%)	189 (100%)
Staff	3 (5.26%)	1 (1.75%)	8 (14.04%)	18 (31.58%)	27 (47.37%)	0	57 (100%)
Staff who were also Unisa students	2 (4.77%)	1 (2.38%)	9 (21.43%)	14 (33.33%)	16 (38.09%)	0	42 (100%)

As seen in Table 4.6, 86 (45.5%) students rated their use of the self-return services as "Very satisfied". In comparison, only three (1.59%) respondents rated their use of the self-return services as "Not satisfied at all". The combined total of student respondents who rated satisfaction with use as 4 or 5 on the scale amounted to 135 (71.43%), the combined total that rated satisfaction with use as 1 or 2 was nine (4.76%) and the total number that was neutral on the question was 41 (21.69%). Four students did not answer the question.

27 (47.37%) staff respondents rated their use of the self-return services as "Very satisfied" while just three (5.26%) respondents rated their use of the self-return services

as “Not satisfied at all”. The combined total of staff respondents who rated satisfaction with use as 4 or 5 amounted to 45 (78.95%), the combined total that rated satisfaction with use as 1 or 2 amounted to four (7.01%) and the number of staff respondents that were neutral on the issue amounted to eight (14.04%).

16 (38.09%) staff members who were also Unisa students rated their use of the self-return services as “Very satisfied” and just two (4.77%) respondents rated their use of the services as “Not satisfied at all”. The combined total of respondents who rated satisfaction with use as 4 or 5 numbered 30 (71.42%), the combined total that rated satisfaction with use as 1 or 2 numbered three (7.15%) and nine (21.43%) were neutral on the issue.

When the combined total of 4 and 5 ratings is taken into consideration it is clear that far more respondents in all three user respondent categories were satisfied with the use of the self-return services than those who were not.

4.6.4 Library staff’s satisfaction with use of the RFID self-return services

The circulation librarians were asked how satisfied they were with the self-return services. A Likert scale was used for this purpose with 1 being “Not satisfied at all” and 5 being” Very satisfied”. Systems librarians were asked the same questions regarding satisfaction. The results are indicated in Table 4.7:

Table 4.7 Library staff’s satisfaction with use of the RFID self-return services

Library staff category	**Rating on Likert scale**					
	1	2	3	4	5	Total
Circulation librarians	1 (4.17%)	3 (12.5%)	8 (33.33%)	6 (25%)	6 (25%)	24 (100%)
Systems librarians	0	0	1 (50%)	1 (50%)	0	2 (100%)

Six (25%) circulation librarians rated their satisfaction with the use of the self-return services as “Very satisfied”, while one (4.17%) rated the use of self-return services as “Not satisfied at all”. The combined total of respondents that rated their satisfaction with use as 4 or 5 was 12 (50%), the combined total that rated their satisfaction with use as 1 or 2 was four (16.67%) and eight (33.33%) were neutral on the matter.

It is clear that like the library users of the self-return services, circulation librarians experienced the self-return services in the main as satisfactory.

One (50%) systems librarian respondent rated satisfaction as 4 and the other rated satisfaction as 3. Thus, most of the systems librarian respondents were satisfied with no respondents indicating dissatisfaction and 50% were either not satisfied or satisfied.

Even though 50% of the systems librarian respondents was neutral regarding satisfaction, the majority of respondents (50%) rated satisfaction as 4 with no respondents rating satisfaction as 1 or 2.

4.7 EASE OF USE OF THE RFID SELF-HELP CIRCULATION SERVICES

Ease of use needed to be investigated as it is an indicator of the presence of factors, best practice and advantages and disadvantages that have an influence on the RFID self-help circulation services. The extent of the ease with which the use of the RFID self-help circulation services is experienced means that there are certain factors, best practice and advantages and disadvantages present that have an influence on RFID self-help circulation services.

The Pearson correlation was calculated between the variables *ease of use* and *satisfaction with use* of the self-help circulation services for library users and library staff. The significance of the correlation was calculated and found to be at the 0.01 level between Table 4.8 to 4.11 below – *ease of use* and Table 4.4 to Table 4.7 – *satisfaction with use*.

4.7.1 Ease of use of the RFID self-issue services by library users

The respondents who used the RFID self-issue services were asked to say how easy the self-issue services were to use. A Likert scale was used with 1 being “Not easy at all” and 5 being” Very easy”. The results are included in Table 4.8 below:

Table 4.8 Ease of use of the RFID self-issue services by library users

Library user category	**Rating on Likert scale**					
	1	2	3	4	5	Total
Students	4 (1.83%)	17 (6.39%)	50 (22.83%)	70 (31.96%)	81 (36.99%)	222 (100%)
Staff	2 (3.33%)	3 (5%)	19 (31.67%)	21 (35%)	15 (25%)	60 (100%)
Staff who were also Unisa students	1 (2.17%)	1 (2.17%)	12 (26.1%)	16 (34.78%)	16 (34.78%)	46 (100%)

As seen in Table 4.8, 81 (36.99%) student respondents rated the use of the self-issue services as “Very easy”. In comparison only four (1.83%) respondents rated the use of the self-issue services as “Not easy at all”. The combined total of student respondents who rated the ease of use as 4 or 5 on the scale amounted to 151 (68.95%), the combined total that rated ease of use as 1 or 2 amounted to 21 (8.22%), while the number that was neutral on the question amounted to 50 (22.83%).

15 (25%) staff respondents rated the use of the self-issue services as “Very easy” with only two (3.33%) rating the use of the self-issue services as “Not easy at all”. The combined total of staff respondents that rated the ease of use as 4 or 5 amounted to 36 (60%), the combined total that rated ease of use as 1 or 2 was five (8.33%) and the number of staff respondents who were neutral in this regard amounted to 19 (31.67%).

16 (34.78%) staff members who were also Unisa students rated the use of the self-issue services as “Very easy” with only one (2.17%) rating them as “Not easy at all”. The combined total of respondents that rated the ease of use as 4 or 5 was 32 (69.56%), the combined total that rated ease of use as 1 or 2 was two (4.34%), while the number of staff respondents who was neutral in this regard numbered 12 (26.1%).

When the combined total of 4 and 5 ratings is taken into consideration it is clear that far more respondents in all three user respondent categories experienced the use of the self-issue services as easy.

4.7.2 Ease of use of the RFID self-issue services as experienced by library staff

The circulation librarians were posed the question as to how easy they found the self-issue services. A Likert scale was used in this regard, with 1 being “Not easy at all” and 5 being” Very easy”. The results are included in Table 4.9 below:

Table 4.9 Ease of use of the RFID self-issue services as experienced by library staff

Library staff category	**Rating on Likert scale**					
	1	2	3	4	5	Total
Circulation librarians	0	1 (4.17%)	4 (16.67%)	9 (37.5%)	10 (41.66%)	24 (100%)

Ten (41.66%) circulation librarians rated the use of the self-issue services as “Very easy”, while none rated it as “Not easy at all”. The combined total of respondents that rated the ease of use as 4 or 5 was 19 (79.16%), the combined total that rated ease of use as 1 or 2 was one (4.17%) and the number of respondents who were neutral on the issue numbered four (16.67%).

It is clear that like the library users of the self-issue services, circulation librarians generally experienced the self-issue services as easy to use.

4.7.3 Ease of use of the RFID self-return services by library users

The respondents who used the self-return services were asked how easy they found the RFID self-return services to use. A Likert scale for this purpose was used with 1 being “Not easy at all” and 5 being” Very easy”. The results are given in Table 4.10 below:

Table 4.10 Ease of use of the RFID self-return services by library users

Library user category	**Rating on Likert scale**						
	1	2	3	4	5	No answer	Total
Students	4 (2.12%)	4 (2.12%)	30 15.87%	44 (23.28%)	105 (55.56%)	2 (1.05%)	189 (100%)
Staff	2 (3.51%)	2 (3.51%)	3 (5.26%)	18 (31.58%)	32 (56.14%)	0	57 (100%)
Staff who were also Unisa students	1 (2.38%)	2 (4.76%)	6 (14.29%)	12 (28.57%)	21 (50%)	0	42 (100%)

As seen in Table 4.10, 105 (55.56%) student respondents rated the use of the self-return services as “Very easy”, while in comparison only four (2.12%) rated it as “Not easy at all”. The combined total of student respondents that rated the ease of use as 4 or 5 on the scale numbered 149 (78.84%), the combined total that rated ease of use as 1 or 2 amounted to eight (4.24%), while the number that was neutral on the question numbered 30 (15.87%). Two respondents did not answer the question.

32 (56.14%) staff respondents rated the use of the self-return services as “Very easy”, with only two (3.51%) rating the use as “Not easy at all”. The combined total of staff respondents that rated the ease of use as 4 or 5 amounted to 50 (87.72%), the combined total that rated it as 1 or 2 was four (7.02%) and the number that was neutral amounted to three (5.26%).

21 (50%) staff who were also Unisa students rated the use as “Very easy”, with only one (2.38%) rating it as “Not easy at all”. The combined total of respondents that rated the ease of use as 4 or 5 numbered 33 (78.57%), the combined total that rated ease of

use as 1 or 2 numbered three (7.14%) and the staff respondents who were neutral on the issue numbered six (14.29%).

When the combined total of 4 and 5 ratings is taken into consideration it is clear that far more respondents in all three user respondent categories experienced the use of the self-return services as easy.

4.7.4 Ease of use of the RFID self-return services as experienced by library staff

The circulation librarians were asked how easy they found the self-return services to use. A Likert scale was used for this purpose, with 1 being “Not easy at all” and 5 being” Very easy”. The results are below:

Table 4.11 Ease of use of the RFID self-return services as experienced by library staff

Library staff category	**Rating on Likert scale**					
	1	2	3	4	5	Total
Circulation librarians	0	1 (4.17%)	4 (16.67%)	8 (33.33%)	11 (45.83%)	24 (100%)

11 (45.83%) circulation librarians rated the use of the self-return services as “Very easy”, while none rated it as “Not easy at all”. The combined total of respondents that rated the ease of use as 4 or 5 amounted to 19 (79.16%), the combined total that rated ease of use as 1 or 2 amounted to one (4.17%) and the respondents who were neutral in this regard numbered four (16.67%).

It is clear that, like library users of the self-return services, circulation librarians in the main experienced the self-return services as easy to use.

4.8 OBJECTIVES FOR IMPLEMENTING THE RFID SELF-HELP CIRCULATION SERVICES

Senior management was asked to indicate what the key objectives were when deciding to implement RFID self-help circulation services. The main objectives identified were the following:

- To deliver an improved service to library users by enabling them to assist themselves and by enhancing the accuracy of issuing and returning books. This is also achieved by providing library processes that are more seamless. This is in accordance with what was found in the literature (see Chapter 2, Section 2.4.1).

- To make circulation librarians more available to focus on training and assisting library users with the specialised services provided by Unisa Library Services. This should be possible as queues should be shorter at the manual loan desk. This objective is in accordance with what was found in the literature (see Chapter 2, Section 2.4.1).

- To shelve books faster as a result of automatic sorting (refer to Chapter 2, Section 2.4.1). In addition, owing to the RFID self-help circulation services, books on hold should be easier to identify during the sorting process. This is also in accordance with what was found in the literature (see Chapter 2, Section 2.4.1).

- To facilitate inventory control as RFID equipment reads the tags inside the library material items without having to take each item from the shelf and scanning the barcode. This objective is in accordance with what was found in the literature (see Chapter 2, Section 2.4.1).

Management was then asked to indicate which of the objectives had been achieved and which had not. Management indicated that the following objectives had been achieved:

Library users were more independent with regard to circulating books and staff were more available to assist library users with specialised library services. In addition, the accuracy of issuing and returning books had been enhanced by the RFID self-help circulation services.

Faster sorting of books was made possible by using the RFID sorter. Holds could also be easily identified during the sorting process.

Management indicated that the following objectives were not achieved:

Inventory control cannot be performed by the RFID equipment. This is due to technological limitations which centre on the tag scanner. A minority of managers stated that staff were not made more available as planned to assist library users with more specialised library services.

4.9 BEST PRACTICE THAT INFLUENCES THE USE OF THE RFID SELF-HELP CIRCULATION SERVICES

There is certain best practice that is internationally accepted and that should, if applied correctly during the implementation and post-implementation process, assist in ensuring an efficient RFID self-help circulation system. In the following section, certain best practice will be discussed by analysing the study data.

4.9.1 Feasibility study

Management indicated that a feasibility study was conducted. In doing so, management and an ICT staff member visited libraries abroad, for example in Singapore. Benchmarking was done using the experiences at other libraries. Managers also gave feedback on RFID self-help circulation services practices after attending conferences. Afterwards specifications that complied with Unisa Library Services' needs were drawn up.

During the feasibility study the different RFID self-help circulation services were investigated and compared. Systems librarians also confirmed that the different systems were compared and decisions were then made on which RFID components would benefit and suit the processes of Unisa Library Services.

4.9.2 General project management

If project management is not handled professionally and efficiently, it can negatively affect the implementation and subsequent use of the RFID self-help circulation services. Information about the general project management during the implementation of the

RFID self-help circulation services was obtained from senior management and the systems librarians.

General project management occurred as follows:

- Two different companies were awarded a tender each for the implementation of RFID self-help circulation services. The first tender was awarded to a company in 2009, while the second was awarded to a different company in 2013. Owing to Unisa tender procedures Unisa Library Services has two different RFID self-help circulation systems.
- The principal project manager was from each of the South African RFID companies while the Director: Library Corporate Services played a monitoring role.
- The project managers of the South African companies to which the first and second tenders were awarded were also responsible for ensuring the most efficient RFID equipment installation – with only online technical support from the overseas partner RFID companies.
- Timelines were established to keep the project on track.
- Regular project meetings were held where feedback was given on the status of the project.
- The different stakeholders (LMS company, RFID companies, Unisa ICT and Unisa University Estates that are responsible for any structural changes to buildings) were identified and were involved as the projects progressed and responsibilities were allocated.
- The tagging project was the responsibility of the first company's project manager and formed a sub-project of the main project.

4.9.3 Change management

Information regarding the handling of change management during and after the implementation project was obtained from library senior management, circulation

librarians, library delivery staff, library shelving staff, library acquisitions tagging staff, inventory control librarians, systems librarians and library users.

The results regarding change management as part of the implementation, as well as post-implementation during the use of the RFID self-help circulation services at Unisa Library Services are as follows:

Management comments:

All senior management indicated that some form of change management formed part of the RFID self-help circulation services implementation. Two senior managers indicated that it was not fully fledged, structured change management, although the general principles of change management were applied during the project. Change management was approached as follows:

- Through communication during meetings held with library staff to indicate the advantages and importance of the RFID technology for Unisa Library Services and its users.
- By sensitising the library staff to possible role changes.
- By formal training of library staff during the implementation phase and in-service training of new library staff after implementation.
- Lastly, through the training of library users by circulation librarians.

The staff of the various library sections and the library users were asked whether they had experienced any form of change management during and after implementation. As part of the question, change management was explained as "including any announcements or posters regarding the self-help services and instructions on using the self-help services either on the Unisa website or on campus and instruction or training in the use". The question was posed separately regarding the self-issue and self-return services to library users. Responses obtained from the library sections staff and the library users regarding experiences relating to the presence or absence of change management are tabulated below.

The Pearson correlation was calculated between the *change management* and self-help *use/non-use* or *satisfaction* variables as follows for library staff and library users:

- Library staff: correlation between *change management* (Table 4.12) and *satisfaction with use* (Table 4.5 and 4.7). The correlation was only calculated for circulation and systems librarians as the other library staff was not involved in assisting users with use of the self-help circulation services.
- Library users: correlation between *change management* (Table 4.13 and 4.14) and self-help *use/non-use* (Table 4.1).

The significance of the correlation between the above variables was found to be at the 0.01 level.

4.9.3.1 Library staff

Table 4.12 Library staff and change management

Library staff category	**Change management experienced**			
	Yes	**No**	**No responses on question**	**Total library staff**
Circulation librarians	8 (33.33%)	11 (45.83%)	5 (20.84%)	24 (100%)
Library delivery staff	2 (66.67%)	1 (33.33%)	0	3 (100%)
Library shelving staff	10 (100%)	0	0	10 (100%)
Library acquisitions tagging staff	3 (75%)	1 (25%)	0	4 (100%)
Library inventory staff	3 (100%)	0	0	3 (100%)

Table 4.12 (cont.) Library staff and change management

Library staff category	Change management experienced			
	Yes	**No**	**No responses on question**	**Total library staff**
Systems librarians	0	2 (100%)	0	2 (100%)
Total (% of a total of 46)	**26 (56.52%)**	**15 (32.61%)**	**5 (10.87%)**	**46 (100%)**

A total of 26 (56.52%) library staff indicated that they had experienced some form of change management during the implementation and use of the RFID self-help circulation services, while 15 (32.61%) indicated that they had not. There were only two groups of library staff who indicated a higher percentage of no change management: circulation librarians with three (12.5%) more “No” than “Yes” responses to the question. The second group was systems librarians with two (100%) respondents who were part of implementation, maintenance and support and the integration of the RFID equipment with the LMS and who indicated they had not experienced any form of change management.

4.9.3.2 Library users – self-issuing

Table 4.13 Library users and change management regarding self-issuing

Library user category	Change management experienced			
	Yes	**No**	**No responses on question**	**Total library users**
Students	148 (30.45%)	330 (67.9%)	8 (1.65%)	486 (100%)

Table 4.13 (cont.) Library users and change management regarding self-issuing

Library user category	Change management experienced			
	Yes	**No**	**No responses on question**	**Total library users**
Staff	33 (34.02%)	61 (62.89%)	3 (3.09%)	97 (100%)
Staff who were also Unisa students	30 (41.66%)	39 (54.17%)	3 (4.17%)	72 (100%)
Total (% of a total of 655)	**211 (32.21%)**	**430 (65.65%)**	**14 (2.14%)**	**655 (100%)**

A total of 430 (65.65%) library users indicated that they had not experienced any form of change management regarding the use of RFID self-issue services, while 211 (32.21%) indicated that they had experienced some form of change management. This is in contrast to the library staff's experience regarding change management.

4.9.3.3 Library users – self-returning

Table 4.14 Library users and change management regarding self-returning

Library user category	Change management experienced			
	Yes	**No**	**No responses on question**	**Total library users**
Students	141 (29.01%)	339 (69.75%)	6 (1.24%)	486 (100%)

Table 4.14 (cont.) Library users and change management regarding self-returning

Library user category	Change management experienced			
	Yes	**No**	**No responses on question**	**Total library users**
Staff	36 (37.11%)	58 (59.80%)	3 (3.09%)	97 (100%)
Staff who were also Unisa students	32 (44.44%)	38 (52.78%)	2 (2.78%)	72 (100%)
Total (% of a total of 655)	**209 (31.91%)**	**435 (66.41%)**	**11 (1.68%)**	**655 (100%)**

A total of 435 (66.41%) library users indicated that they had not experienced any form of change management regarding the use of the RFID self-return services, while only 209 (31.91%) library users indicated that they had done so. This is in contrast to the library staff's experience of change management.

4.9.4 Changes to buildings to cater for the RFID self-help circulation services equipment

Information on which changes were necessary to buildings was obtained from senior management and systems librarians. The following changes were necessary:

- The self-return machines needed enough space to make provision for the return machine and the return bin. In this regard, a separate room, or a specially built enclosure, was necessary with no access except for authorised library staff. The touch-screen and the front of the receiving conveyor part of the machine were built into the user-facing side of the enclosure or room.
- The sorter machine required changes to be made to the room to allow enough space for sorting staff to sort and move the bins in and out. In addition, the

Muckleneuk library delivery section had to be rearranged to allow space for the tables and shelves required for the books during sorting.

- All the above equipment had to be provided with connections to the network and power outlets.
- During changes to buildings, the historical value of buildings like the Unisa East London library building had to be taken into account. In such cases, regulations must be adhered to.

4.9.5 Placement of RFID self-help circulation services to enable circulation librarians to monitor use

Circulation librarians responsible for assisting library users with RFID self-help circulation services were asked whether the machines were placed in a location that enabled them to monitor and assist users easily. The results are provided in Figure 4.5 below:

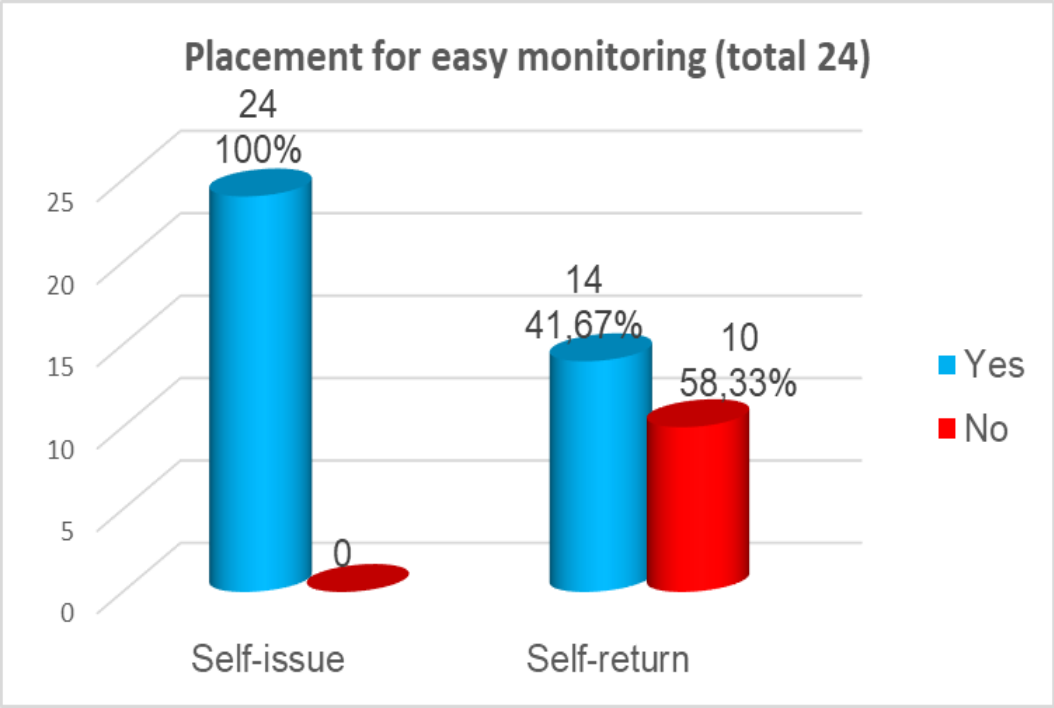

Figure 4.5 Placement of self-help services to enable monitoring of use

Twenty-four (100%) respondents indicated that the self-issue services were placed in such a way that monitoring of use was easy. In comparison, 14 (58.33%) indicated that the self-return services had not been placed in such a way that monitoring of use was

easy, while ten (41.67%) respondents indicated that self-return services were placed in such a way that monitoring could be done easily.

The first variable in calculating the Pearson correlation was the *placement* of self-help circulation services to enable circulation librarians to easily monitor use. The second variable was the circulation librarians' *satisfaction* with the self-help circulation services while assisting library users. The significance of the correlation was calculated and found to be at the 0.01 level between the *placement* variable in Figure 4.5 above and circulation librarian *satisfaction* in Table 4.5 and Table 4.7.

4.9.6 Standards and protocols with which the RFID self-help circulation services system must comply

Information regarding standards and protocols was obtained from the systems librarians and senior management. RFID systems must comply with certain standards to ensure that the different RFID vendors' RFID tags and the RFID equipment are compatible. Standards are also necessary to ensure that if two different RFID systems are implemented, as happened at Unisa Library Services, the different equipment can be used together easily. The most important standard is the standard radio frequency of 13.56 MHz with which the RFID tags and equipment must comply. The two RFID systems and the RFID tags used by Unisa Library Services comply with these standards.

Another standard is the one that stipulates the internationally accepted way of placing the tags in the items. This is explained in more detail in Section 4.10.1.

Certain protocols are also very important when choosing a RFID self-help circulation services system. Protocols are software that enable the LMS and the RFID self-help circulation system to send data easily and effectively between the two systems. An example is the sending of data during self-issue or return between the RFID self-help circulation system and the LMS. The most crucial protocol that are relevant in this case are the SIP2 protocol. Unisa's two RFID self-help circulation systems and the LMS mostly comply with these protocols. In Section 4.9.7 some non-compliance issues of the systems are highlighted.

4.9.7 Integration of the Library Management System (LMS) and the RFID self-help circulation services system

Senior management and the systems librarians were posed questions to ascertain whether the integration of the LMS and the RFID self-help circulation services systems had been successful. The results were as follows:

Integration had been only partially successful. Owing to integration issues the following functionalities could not be made available:

- The renewal of books via the self-issue services is not possible due to an inconsistency between the LMS and the RFID SIP2.
- Another inconsistency between the LMS and the RFID SIP2 does not allow library users to access their library account and fines via the self-issue machines.
- When more than one book is checked out via the self-issue services, not all books are necessarily checked out on the LMS even though the EM security strips on all the books may be desensitised.
- Not all books are necessarily returned on the LMS patron record although they seem to be successfully returned via the book return. In these cases, a receipt may even be printed, creating the impression that the book has been returned successfully.
- The only item status that can be identified by the sorting machine during the automatic sorting process is the “On hold” status.
- Inventory control cannot be performed.

4.9.8 Ensuring library users are encouraged to use the RFID self-help circulation services

Circulation librarians were asked to explain how they ensured that library users use the RFID self-help circulation services rather than the manual circulation desk services. The responses of respondents are summarised as follows:

Circulation librarians explained the advantages of using the self-help circulation services to library users visiting the libraries, highlighting the convenience of the services, that is, that users are able to issue and return books themselves whenever it suits them. Circulation librarians also trained users in the use of the self-help services using the library orientation programme or individually when users visit the manual circulation desk.

However, it must be noted that some respondents indicated that library users were not always actively encouraged to use these services. Some circulation librarians felt that it did not amount to good service to actively encourage users to use the self-help services if they did not want to. Hence, if users were resistant to using the self-help services they were assisted at the manual circulation desk. It should be noted that some respondents indicated that users were not allowed to use the manual circulation desk if there were no problems with the self-help circulation services. Interestingly, some respondents indicated that Unisa staff and even library staff were not always willing to use the self-help services. Another issue that was mentioned was that it is sometimes difficult to assist users with the self-return services as the machines are not close to the manual circulation desk in all branch libraries.

4.10 FACTORS HAVING AN INFLUENCE ON THE RFID SELF-HELP CIRCULATION SERVICES

The factors that influenced the RFID self-help circulation services were analysed.

4.10.1 The tagging sub-project

Information on the management of the tagging sub-project was obtained from library senior management and acquisitions tagging staff.

Tagging of library material with RFID tags entails adding information to a RFID tag which is then affixed in a library material item. The information on the tag is read using a RFID tag reader and is then communicated to the LMS.

The tagging project occurred as follows:

- The original bulk tagging of library material was the responsibility of the RFID company that was awarded the first tender.

- Unisa Library Services was the first library service where the chosen RFID company was involved in tagging library material.
- Tagging was done by student worker teams with one of the student workers in each team appointed as team leader.
- Quality control of the tagging project was the responsibility of the cataloguing section.
- A decision was taken during the project to include only the item barcode number on each tag and for example not the title. Where other libraries also added the title for example, this was omitted by Unisa Library Services. The reason for this is that when the RFID tag is read by a RFID tag reader, only the barcode number is necessary to link to the item record information on the LMS. Some additional information was also entered as described in the tagging of new library material process below.
- It was subsequently found that the RFID tags had not been placed in the library material in line with the internationally accepted standard.

At the time of the study, the tagging of new library material after the completion of the tagging project was performed as follows:

- Tagging of new items is the responsibility of the acquisitions tagging staff.
- Tags are placed on the inside of the back page of books. If there is information on the back page which is considered important, the tag will be placed on the first page from the back that is empty. RFID tags should be placed in the books in line with the internationally accepted standard, as this is supposed to cater for easier inventory control. Accordingly, the tags should be placed in a staggered way in the books. This means that the first tag should be placed approximately 5 mm from the top of the back page and at a specific distance (2–3 mm) from the spine of the first book being tagged. The tag on the second book should be placed lower down on the back page and at the same specific distance from the spine. The tag in the next book will be placed lower down on the back page than the second book. The same procedure will then be repeated for the books that follow.

- During the interviews, it was found that one of the staff members responsible for tagging indicated that they did not stagger tags as per the specifications, while another indicated that they were unsure about the tagging process. The other two staff members described in detail how the tags are placed and staggered.

- With CDs and DVDs, the tags are placed on the last page of the jacket or booklet in the CD or DVD case. If there is important information that will be covered by the tags, a separate piece of paper is pasted into the case and the tag is positioned on it.

- The information on the tags consists of the corresponding barcode number of the library material item; this is scanned onto the tag using tagging software. When a tag is read by the RFID reader, the barcode number is used to identify the corresponding item on the LMS. The country ID and ILL code of Unisa Library Services are also entered into fields in the tagging software and the relevant material type is entered onto the tag; for example book, media package, DVD, CD. The option “Not allow circulation” is used for bound journals and reference works earmarked as not for circulation to library users.

- Where books have accompanying material that is accessioned separately, they are entered as a media package.

- Some of the older books and Technikon South Africa (TSA) books that became part of the Unisa Library Services during the merger of the two institutions do not have the 10-digit barcode numbers that are currently in use by Unisa Library Services. In such cases, zeros must be added manually at the beginning of the barcode numbers during the tagging process.

- The barcode numbers are scanned onto the tags using RFID conversion stations. Two types of conversion stations were used: the older conversion stations were obtained as part of the 2010 RFID implementation project, while the newer ones were obtained as part of the 2013 project. Both can only be used to read or write and edit barcode numbers on the tags.

4.10.2 Quality of tagging

Questions relating to the quality of the tagging process were posed to the shelving staff, the delivery staff and the circulation librarians at the Muckleneuk branch library during the interviews and to the circulation librarians at the remote branches using an online questionnaire. Information was obtained about the number of library material items that was found to be lacking RFID tags, items where the RFID equipment could not read the information on the tags, and items where the tags had been removed or damaged. Books where tags had been removed or damaged were identified by library staff by checking for indications of any remaining parts of tags, for example tag pieces and glue.

The Pearson correlation was calculated between each of the *three variables regarding problems with tags* mentioned above and tabulated in Table 4.21 to Table 4.26 and circulation librarians' *satisfaction* with the self-help circulation services (Table 4.5 and Table 4.7). Only circulation librarians' experience with tag problems was used for the correlation calculation. The experience of the other library staff who detected tag problems below was not included in the calculation. The reason for this was that none of them were involved in assisting users with the self-help circulation services. The significance of the correlation was calculated and found to be at the 0.01 level for each of the *three tag variables* and circulation librarian *satisfaction*.

4.10.2.1 Tagging problems detected by shelving staff since the RFID implementation

Shelving staff were posed three questions in relation to problems detected with the quality of tagging, as mentioned in Section 4.10.2. Respondents indicated that tagging problems were detected while sorting books using the RFID sorter, as well as when counting the books used in the library using the RFID staff workstation. The results are displayed in Table 4.15 as follows:

Table 4.15 Books without RFID tags (shelving staff)

Number of books	Yes
None at all	
Less than 10	
10–20	
21–30	
31–40	
41–50	
51–60	
61–70	
71–80	
81–90	
91–100	
More than 100	10 (100%)
Total	10 (100%)

Ten (100%) of the respondents indicated that they had found more than 100 books without tags since the implementation of the RFID self-help circulation services.

Table 4.16 Books with unreadable tag information (shelving staff)

Number of books	Yes
None at all	
Less than 10	
10–20	
21–30	
31–40	
41–50	
51–60	1 (10%)
61–70	1 (10%)
71–80	
81–90	
91–100	
More than 100	8 (80%)
Total	10 (100%)

The majority of respondents – eight (80%) – indicated that they had found more than 100 books where the information on the tags could not be read. One (10%) respondent indicated that between 61 and 70 books had been found where the information on the tags could not be read by the RFID sorter and staff workstation. Another one (10%) respondent indicated that between 51 and 60 books had been found with this problem.

Table 4.17 Books with the RFID tags removed or damaged (shelving staff)

Number of books	Yes
None at all	
Less than 10	3 (30%)
10–20	3 (30%)
21–30	
31–40	4 (40%)
41–50	
51–60	
61–70	
71–80	
81–90	
91–100	
More than 100	
Total	10 (100%)

Four (40%) respondents found between 31 and 40 books with the tags removed or damaged, while three (30%) indicated that they had found between 10 and 20 books with this problem. Another three (30%) indicated that they had found fewer than 10 books.

4.10.2.2 Tagging problems detected by shelving staff between January and December 2015

Shelving staff were also asked the same three questions relating to the problems detected with the quality of tagging for the period January to December 2015. Respondents detected these problems when sorting books using the RFID sorter, as well as when counting the books used in the library using the RFID staff workstation. The results are displayed in Table 4.18:

Table 4.18 Books without RFID tags – January to December 2015 (shelving staff)

Number of books (per month)	Yes
None at all	
Less than 10	
10–20	
21–30	3 (30%)
31–40	
41–50	7 (70%)
51–60	
61–70	
71–80	
81–90	
91–100	

Table 4.18 (cont.) Books without RFID tags – January to December 2015 (shelving staff)

Number of books (per month)	Yes
More than 100	
Total	10 (100%)

The majority of respondents, seven (70%), indicated that they had found between 41 and 50 books per month without any tags between January and December 2015. On the other hand, three (30%) respondents indicated that they had found between 21 and 30 books with this problem during this period.

Table 4.19 Books with unreadable tag information – January to December 2015 (shelving staff)

Number of books (per month)	Yes
None at all	
Less than 10	
10–20	
21–30	
31–40	
41–50	
51–60	4 (40%)
61–70	
71–80	3 (30%)

Table 4.19 (cont.) Books with unreadable tag information – January to December 2015 (shelving staff)

Number of books (per month)	Yes
81–90	
91–100	
More than 100	3 (30%)
Total	10 (100%)

In addition, during this period, three (30%) respondents had found more than 100 books per month where the information on the RFID tags was unreadable, three (30%) indicated that they had found between 71 and 80 books per month and four (40%) indicated that they had found between 51 and 60 books.

Table 4.20 Books with the RFID tags removed or damaged – January to December 2015 (shelving staff)

Number of books (per month)	Yes
None at all	
Less than 10	5 (50%)
10–20	
21–30	5 (50%)
31–40	
41–50	

Table 4.20 (cont.) Books with the RFID tags removed or damaged – January to December 2015 (shelving staff)

Number of books (per month)	Yes
51–60	
61–70	
71–80	
81–90	
91–100	
More than 100	
Total	10 (100%)

During this period, five (50%) of the ten respondents indicated that they found between 21 and 30 books per month that could not be sorted or counted because the RFID tags had been removed or damaged, while another five (50%) indicated that they had found less than 10 books per month with this problem.

4.10.2.3 Tagging problems detected by circulation librarians since the RFID implementation

Circulation librarians were posed three questions in relation to the problems detected with tagging quality, as mentioned in Section 4.10.2. The respondents detected tagging problems while assisting self-help circulation users and circulating books using the RFID staff workstations. The results are displayed in Table 4.21 below:

Table 4.21 Books without RFID tags (circulation librarians)

Number of books	Yes	No answer	Total
None at all	2 (8.33%)		
Less than 10	6 (25%)		
10–20	2 (8.33%)		
21–30	0		
31–40	0		
41–50	3 (12.5%)		
51–60	0		
61–70	0		
71–80	0		
81–90	1 (4.17%)		
91–100	1 (4.17%)		
More than 100	4 (16.67%)		
No answer		5 (20.83%)	
Total	19 (79.17%)	5 (20.83%)	24 (100%)

Four (16.67%) respondents indicated that they had found more than 100 books without RFID tags since the implementation of RFID self-help circulation services. One respondent (4.17%) found between 91 and 100 books with such problems, one (4.17%) between 81 and 90 books, three (12.5%) between 41 and 50 books, two (8.33%) between 10 and 20 books, while six (25%) respondents indicated that they had found fewer than 10 books without RFID tags and two (8.33%) had found no books. Five (20.83%) respondents did not answer the question.

Table 4.22 Books with unreadable tag information (circulation librarians)

Number of books	Yes	No answer	Total
None at all	1 (4.17%)		
Less than 10	9 (37.5%)		
10–20	2 (8.33%)		
21–30	0		
31–40	0		
41–50	1 (4.17%)		
51–60	0		
61–70	0		
71–80	0		
81–90	1 (4.17%)		
91–100	1 (4.17%)		
More than 100	4 (16.67%)		

Table 4.22 (cont.) Books with unreadable tag information (circulation librarians)

Number of books	Yes	No answer	Total
No answer		5 (20.83%)	
Total	19 (79.17%)	5 (20.83%)	24 (100%)

Four (16.67%) respondents indicated that they had found more than 100 books where the tag information was unreadable, one (4.17%) had found between 91 and 100 books, one (4.17%) between 81 and 90 books, one (4.17%) between 41 and 50 books, two (8.33%) between 10 and 20 books, while nine (37.5%) respondents indicated that they found fewer than 10 books with unreadable information and one (4.17%) had found no books at all with this problem since implementation. Five (20.83%) respondents did not answer the question.

Table 4.23 Books with the RFID tags removed or damaged (circulation librarians)

Number of books	Yes	No answer	Total
None at all	7 (29.17%)		
Less than 10	5 (20.83%)		
10–20	0		
21–30	1 (4.17%)		
31–40	0		
41–50	2 (8.33%)		

Table 4.23 (cont.) Books with the RFID tags removed or damaged (circulation librarians)

Number of books	Yes	No answer	Total
51–60	1 (4.17%)		
61–70	0		
71–80	0		
81–90	0		
91–100	1 (4.17%)		
More than 100	2 (8.33%)		
No answer		5 (20.83%)	
Total	19 (79.17%)	5 (20.83%)	24 (100%)

Two (8.33%) respondents indicated they had found more than 100 books with RFID tags removed or damaged since implementation, one (4.17%) had found 91 to 100 books, one (4.17%) 51 to 60 books, two (8.33%) 41 to 50 books, one (4.17%) 21 to 30 books, five (20.83%) had found fewer than 10 books, while seven (29.17%) indicated that they had found no books. Five (20.83%) respondents did not answer the question.

4.10.2.4 Tagging problems detected by circulation librarians between January and December 2015

Circulation librarians were also asked the same three questions relating to the problems detected with the quality of tagging for the period January to December 2015. The respondents detected tagging problems while assisting self-help users and when

circulating books using the RFID staff workstations. The results are displayed as follows in Table 4.24:

Table 4.24 Books without RFID tags – January to December 2015 (circulation librarians)

Number of books (per month)	Yes	No answer	Total
None at all	3 (12.5%)		
Less than 10	9 (37.5%)		
10–20	3 (12.5%)		
21–30	2 (8.33%)		
31–40	0		
41–50	1 (4.17%)		
51–60	0		
61–70	0		
71–80	0		
81–90	0		
91–100	1 (4.17%)		
More than 100	0		
No answer		5 (20.83%)	
Total	19 (79.17%)	5 (20.83%)	24 (100%)

One (4.17%) respondent had found 91 to 100 books monthly between January to December 2015 without RFID tags, one (4.17%) had found 41 to 50 books, two (8.33%) had found 21 to 30 books, three (12.5%) between 10 and 20 books, nine (37.5%) had found fewer than 10 books and another three (12.5%) indicated that they had found none. Five (20.83%) respondents did not answer the question.

Table 4.25 Books with unreadable tag information – January to December 2015 (circulation librarians)

Number of books (per month)	Yes	No answer	Total
None at all	2 (8.33%)		
Less than 10	9 (37.5%)		
10–20	1 (4.17%)		
21–30	3 (12.5%)		
31–40	1 (4.17%)		
41–50	1 (4.17%)		
51–60	1 (4.17%)		
61–70	0		
71–80	0		
81–90	0		
91–100	0		
More than 100	1 (4.17%)		

Table 4.25 (cont.) Books with unreadable tag information – January to December 2015 (circulation librarians)

Number of books (per month)	Yes	No answer	Total
No answer		5 (20.83%)	
Total	19 (79.17%)	5 (20.83%)	24 (100%)

One (4.17%) respondent indicated they had found more than 100 books where the RFID equipment could not read the information on the RFID tags monthly between January to December 2015, one (4.17%) had found 51 to 60 books, one (4.17%) 41 to 50 books, one (4.17%) 31 to 40 books, three (12.5%) 21 to 30 books, and one (4.17%) 10 to 20 books, while nine (37.5%) respondents indicated that they had found fewer than 10 books monthly for the same period and two (8.33%) indicated they found no books at all with this problem. Five (20.83%) respondents did not answer the question.

Table 4.26 Books with the RFID tags removed or damaged – January to December 2015 (circulation librarians)

Number of books (per month)	Yes	No answer	Total
None at all	10 (41.67%)		
Less than 10	8 (33.33%)		
10–20	0		
21–30	1 (4.17%)		
31–40	0		

Table 4.26 (cont.) Books with the RFID tags removed or damaged – January to December 2015 (circulation librarians)

Number of books (per month)	Yes	No answer	Total
41–50	0		
51–60	0		
61–70	0		
71–80	0		
81–90	0		
91–100	0		
More than 100	0		
No answer		5 (20.83%)	
Total	19 (79.17%)	5 (20.83%)	24 (100%)

One (4.17%) respondent had found 21 to 30 books with the tags removed or damaged monthly, eight (33.33%) respondents found fewer than 10 books and ten (41.67%) indicated that they had found none. Five (20.83%) respondents did not answer the question.

4.10.2.5 Tagging problems detected by delivery staff since the RFID implementation

Delivery staff were posed three questions on the problems detected with the quality of tagging, as mentioned in Section 4.10.2. Such tagging problems were detected when

circulating books requested by library users from the online catalogue using the RFID staff workstations. The results are as follows:

Table 4.27 Books without RFID tags (delivery staff)

Number of books	Yes
None at all	
Less than 10	
10–20	
21–30	1 (33.33%)
31–40	
41–50	
51–60	
61–70	2 (66.67%)
71–80	
81–90	
91–100	
More than 100	
Total	3 (100%)

Two (66.67%) respondents indicated that they had found between 61 and 70 books without RFID tags since RFID self-help circulation services implementation, while one (33.33%) had found 21 to 30 books with this problem.

Table 4.28 Books with unreadable tag information (delivery staff)

Number of books	Yes
None at all	
Less than 10	
10–20	
21–30	
31–40	
41–50	
51–60	2 (66.67%)
61–70	
71–80	1 (33.33%)
81–90	
91–100	
More than 100	
Total	3 (100%)

One (33.33%) respondent had found 71 to 80 books where the information on the tags could not be read by the staff workstations, while two (66.67%) respondents indicated that between 51 to 60 books had been found.

Table 4.29 Books with the RFID tags removed or damaged (delivery staff)

Number of books	Yes
None at all	
Less than 10	
10–20	
21–30	1 (33.33%)
31–40	
41–50	2 (66.67%)
51–60	
61–70	
71–80	
81–90	
91–100	
More than 100	
Total	3 (100%)

Two (66.67%) respondents had found 41 to 50 books with the tags removed or damaged, while one (33.33%) respondent found 21 to 30 such books.

4.10.2.6 Tagging problems detected by delivery staff between January and December 2015

Delivery staff were also asked the same three questions relating to the problems detected with the quality of tagging for the period January to December 2015. The problems were detected when circulating books requested by library users from the online catalogue using the RFID staff workstations. The results are displayed in Table 4.30 below:

Table 4.30 Books without RFID tags – January to December 2015 (delivery staff)

Number of books (per month)	Yes
None at all	
Less than 10	1 (33.33%)
10–20	
21–30	2 (66.67%)
31–40	
41–50	
51–60	
61–70	
71–80	
81–90	

Table 4.30 (cont.) Books without RFID tags – January to December 2015 (delivery staff)

Number of books (per month)	Yes
91–100	
More than 100	
Total	3 (100%)

The majority of respondents – two (66.67%) – indicated that they found 21 to 30 books per month without tags, while one (33.33%) found fewer than 10 books per month without tags.

Table 4.31 Books with unreadable tag information – January to December 2015 (delivery staff)

Number of books (per month)	Yes
None at all	
Less than 10	2 (66.67%)
10–20	1 (33.33%)
21–30	
31–40	
41–50	
51–60	
61–70	

Table 4.31 (cont.) Books with unreadable tag information – January to December 2015 (delivery staff)

Number of books (per month)	Yes
71–80	
81–90	
91–100	
More than 100	
Total	3 (100%)

One (33.33%) respondent had found 10 to 20 books while two (66.67%) respondents had found fewer than 10 books where the tags were unreadable.

Table 4.32 Books with the RFID tags removed or damaged (delivery staff) – January to December 2015

Number of books (per month)	Yes
None at all	1 (33.33%)
Less than 10	2 (66.67%)
10–20	
21–30	
31–40	
41–50	
51–60	

Table 4.32 (cont.) Books with the RFID tags removed or damaged (delivery staff) – January to December

Number of books (per month)	Yes
61–70	
71–80	
81–90	
91–100	
More than 100	
No answer	
Total	3 (100%)

Two (66.67%) respondents had found fewer than 10 books with the tags removed or damaged per month and one (33.33%) had found none.

From the above it is clear that even as late as December 2015, many tagging problems were still occurring, with tagging standards not always being followed. Insufficient training plays a part in the tagging problems. Such problems cause delays in the delivery of books to library users as books cannot be issued or returned either by the users themselves or the manual circulation desk. The same applies to the delivery section when staff try to issue books using the RFID staff workstations.

4.10.3 Training

Training was included as part of the two RFID self-help implementation projects. The companies that were awarded the tenders for these were also responsible for training library staff in the use of the RFID equipment. Library user training by the circulation librarians also occurred as part of familiarising library users with the new self-help circulation services. New staff were also given in-service training.

Information on library staff and user training on the RFID self-help circulation services was obtained from the circulation librarians and library users.

The Pearson correlation was calculated as follows between the *training* variable and the self-help *use/non-use* variable for library users or *satisfaction* variable for library staff:

- Library users: correlation between *training* (Table 4.34 and 4.35) and self-help *use/non-use* (Table 4.1).

- Library staff: correlation between *training* (Table 4.33) and *satisfaction* with use (Table 4.5 and 4.7). The correlation was only calculated for circulation librarians as the other library staff were not involved in assisting users with use of the self-help circulation services.

The significance of the correlation between the above variables was found to be at the 0.01 level.

4.10.3.1 Circulation librarians' training in the use of the RFID self-help circulation services (24 in total)

The responses from the circulation librarians (24 in total) regarding training received in the use of the RFID self-help circulation services to assist library users with self-issue and self-return of books are shown in Table 4.33 below:

Table 4.33 Training received by circulation librarians

Self-help circulation training received (total 24)							
Was training received on self-issuing and self-returning *OR* only on self-issuing *OR* only on self-returning? – Yes		**Did training enable assisting users on self-issuing and self-returning *OR* only on self-issuing *OR* only on self-returning?**		**Received training on self-help issuing and returning – No**		**If training would have been received, would it have enabled use of the self-issue services?**	
Yes	*No answer	Yes	No	No	*No answer	Yes	No
21 *OR* 1 *OR* 0 = 22 (91.67%)	1 (4.17%)	20 *OR* 1 *OR* 0 = 21 (95.45%)	1 (4.55%)	1 (4.17%)	1- same as Yes answer	1 (100%)	0

***** "No answer" is the same respondent for both "Yes" and "No" answers on whether training was received or not.

22 (91.67%) respondents indicated that they had received training. Of these, 4.17% or one respondent had received training on only the use of self-issuing and not self-returning. Zero respondents received training in only self-returning. One (4.17%) respondent did not answer the question. On the question of whether training contributed to circulation librarians assisting users better, 21 (95.45%) indicated that training had indeed been helpful in this regard. Of the 21 (95.45%), 4.55% or one respondent had received training only on the use of self-help issuing and not returning. Just one respondent (4.55%) indicated that training had not contributed to assisting library users, while one respondent (4.17%) indicated that no training had been received on self-help issuing and returning and one (4.17%) respondent did not answer the question. On the question of whether training would have helped to enable the circulation librarian who did not receive training to assist users, the answer was "Yes".

4.10.3.2 Library users' training in the use of the RFID self-help circulation services

It should be noted that respondents were asked to answer the questions on training whether they used the RFID self-help circulation services or not. The reason for this is that the presence or absence of training might be relevant in both cases. The assumption was that whether or not a library user received training in the use of self-help circulation services could influence whether they used the services or not.

4.10.3.2.1 Library users' training in the use of the RFID self-issue services

The 486 students, 97 staff and 72 staff who were also Unisa students responded as follows on the questions regarding the self-issue training:

Table 4.34 Training received by library users in the use of the RFID self-issue services

Library user category	**Self-issue user training**							
	Received training on the self-issue services? – Yes		**Did training enable use of the self-issue services?**		**Received training on the self-issue services? – No**		**If training would have been received, would it have enabled use of the self-issue services?**	
	Yes	*No answer	Yes	No	No	*No answer	Yes	No
Students (total 486)	127 (26.13%)	11 (2.26%)	121 (95.3%)	6 (4.72%)	348 (71.61%)	11 – same as Yes answer (2.26%)	199 (57.18%)	149 (42.82%)

Table 4.34 (cont.) Training received by library users in the use of the RFID self-issue services

Library user category	**Self-issue user training**							
	Received training on the self-issue services? – Yes		**Did training enable use of the self-issue services?**		**Received training on the self-issue services? – No**		**If training would have been received, would it have enabled use of the self-issue services?**	
	Yes	*No answer	Yes	No	No	*No answer	Yes	No
Staff (total 97)	41 (42.27%)	4 (4.12%)	40 (97.56%)	1 (2.44%)	52 (53.61%)	4 – same as Yes answer (4.12%)	28 (53.85%)	24 (46.15%)
Staff who were also Unisa students (total 72)	21 (29.17%)	3 (4.16%)	19 (90.48%)	2 (9.52%)	48 (66.67%)	3 – same as Yes answer (4.16%)	24 (50%)	24 (50%)

***** "No answer" is the same respondents for both "Yes" and "No" answers on whether training was received or not.

Questions on whether training was received on the use of the self-issue services were posed to the categories of library users as listed in Table 4.34. 127 (26.13%) student respondents had received training, 121 (95.3%) of whom indicated that the training had enabled them to use the self-issue services while six (4.72%) indicated training had not enabled them.

The majority of student respondents, 348 (71.61%), did not receive training. Of these, 199 (57.18%) indicated that training would have been of value if it had been received; in contrast, 149 (42.82%) indicated that training would not have enabled the use of the

self-issue services. The latter is a quite high percentage of respondents in relation to the respondents (57.18%) that indicated that they would have been enabled by the training.

41 (42.27%) staff respondents had received training. Of these, 40 (97.56%) indicated that training had helped them to use the self-issue services and only one (2.44%) indicated that training had not assisted him or her. On the other hand, 52 (53.61%) staff respondents had not received training, of which 28 (53.85%) indicated that training would have enabled them to use the self-issue services and 24 (46.15%) indicated it would not have enabled them. The percentage of respondents who did not receive training and who indicated that training would not have enabled them to use the self-issue services is high, as was found with the students.

21 (29.17%) staff members who were also Unisa student respondents had received training. Of these, 19 (90.48%) indicated that training had enabled them to use the self-issue services, while two (9.52%) stated that training had not enabled them. In addition, 48 (66.67%) indicated that they had not received training, 24 (50%) of whom indicated that training would not have enabled them in using the self-issue services and 24 (50%) stating the opposite. The percentage of respondents who did not receive training and who indicated that training would not have enabled them to use the self-issue services is high, as was found with both the students and the staff respondents.

4.10.3.2.2 Library users' training in the use of the RFID self-return services

The 486 students, 97 staff members and 72 staff who were also Unisa students responded as follows on the questions regarding the self-return services training (see Table 4.35):

Table 4.35 Training received by library users in the use of the RFID self-return services

Library user category	**Self-return user training**							
	Was training received on the self-return services? – Yes		**Did training enable use of the self-return services?**		**Was training received on the self-return services? – No**		**If training would have been received, would it have enabled use of the self-return services?**	
	Yes	*No answer	Yes	No	No	*No answer	Yes	No
Students (total 486)	80 (16.4%)	10 (2.1%)	79 (98.75%)	1 (1.25%)	396 (81.5%)	10 – same as Yes answer (2.1%)	221 (55.81%)	175 (44.19%)
Staff (total 97)	28 (28.87%)	4 (4.12%)	26 (92.9%)	2 (7.1%)	65 (67.01%)	4– same as Yes answer (4.12%)	28 (43.1%)	37 (56.9%)
Staff who were also Unisa students (total 72)	10 (13.89%)	3 (4.17%)	9 (90%)	1 (10%)	59 (81.9%)	3 – same as Yes answer (4.17%)	30 (50.85%)	29 (49.15%)

* “No answer” is the same respondents for both Yes and No answers on whether training was received or not.

80 (16.4%) students had received training, of whom 79 (98.75%) indicated that the training had enabled them in using the self-return services. One (1.25%) did not feel

that the training had assisted him or her. A staggering 396 (81.5%) had not received training, with 221 (55.81%) of these indicating that if they had received training they would have been enabled to use the self-return services and 175 (44.19%) stating that they would not have been enabled to use the services. Again, the percentage of respondents that indicated that they would not have been enabled by training to use the self-return services in relation to those that indicated they would have been enabled is quite high.

28 (28.87%) staff indicated that they had received training in the use of the self-return services; 26 (92.9%) of these indicated that training had enabled them to use the self-return services, with two (7.1%) indicating otherwise. 65 (67.01%) had not received training, 28 (43.1%) of whom indicated that training would have enabled them to use the self-return services and 37 (56.9%) indicated that it would not. In the case of staff, the percentage of respondents that did not receive training and indicating they would not have been enabled by the self-return services – 37 (56.9%) is even higher than respondents who indicated they would have been enabled 28 (43.1%).

Only ten (13.89%) of the staff who were also Unisa students had received training, with nine (90%) of the 13.89% indicating that the training had assisted them and one (10%) feeling that it had not. 59 (81.9%) had not received training and 30 (50.85%) of these indicated that they would have benefited from training and 29 (49.15%) indicated they would not. The percentage of respondents that had not received training and that indicated that they would not have been enabled by self-return training is only 1.7% (one) less than the respondents who indicated that they would have been enabled by training.

The reasons for this high percentage of respondents who had not received training and who indicated that training would not have enabled them in the use of the self-help services is investigated in the following section.

4.10.3.3 Reasons for the high percentage of library users that had not received training and indicated that training would not have enabled them to use the self-help services

The qualitative comments that respondents could make as part of the questions on whether or not they used the self-issuing and self-returning services were investigated.

It should be noted that not all the respondents that indicated that they did not use the self-help services gave reasons why they did not use these services.

The reasons why respondents who had not received training indicated that even if they had received training it would not have enabled them to use the self-help services may be categorised as follows:

- Respondents did not use any form of library services.
- They did not issue or return books from the library. In this case most respondents indicated that they used the library only for study purposes or preferred to use books in the library as they were afraid that the books might be damaged if taken out. Many undergraduate students did not need them for their studies because the prescribed books and course material are sufficient.
- They requested books online from the Unisa library online catalogue and then returned them using courier or mail.
- They only needed to access Unisa Library Services' online e-resources.

From the above it could be ascertained that respondents who formed part of any of the above categories did not feel that they would have been enabled had they received the training; hence, training in the use of the RFID self-help circulation services would not have been of use to them.

4.10.3.4 A comparison of the use of the self-help circulation services and whether training was received

A comparison was made between the use of the RFID self-help circulation services and whether training had been received or not. The respondents were the 486 students, 97 staff members and 72 staff who were also Unisa student users.

4.10.3.4.1 Students (total of 486)

The results for the 486 student users are as follows:

Table 4.36 Student user training and use of self-help services

Self-help type	Training and use of self-help services					
	Received training and used the services	**Received training and did not use the services**	**Did not receive training and used the services**	**Did not receive training and did not use the services**	**No response**	**Total**
Self-issue	125 (25.72%)	2 (0.41%)	91 (18.72%)	257 (52.89%)	11 (2.26%)	486 (100%)
Self-return	76 (15.64%)	3 (0.62%)	107 (22.02%)	290 (59.67%)	10 (2.05%)	486 (100%)

The above results show that 257 (52.89%) students did not receive training and did not use the self-issue services, 125 (25.72%) students who received training used the self-issue services, 91 (18.72%) used the services even though they did not receive training and only two (0.41%) did not use the self-issue services although they received training. These results seemed to indicate the importance of training.

The results for the self-return services seem to confirm the same trend as for the self-issue services. The only difference is the 107 (22.02%) students who did not receive training but who used the services in comparison to only 76 (15.64%) students who received training and used the services. This might be explained by studying Table 4.10, which indicates that 78.84% of respondents rated ease of use of the self-return services as 4 or 5 on the Likert scale. If respondents experience the use of the self-return services as easy it explains this trend. The comments made by students also confirm this. Some students indicated that training was not necessary as the self-return services were quite easy to use with clear on-screen instructions.

4.10.3.4.2 Staff (total of 97)

The results for the 97 staff users are as follows:

Table 4.37 Staff user training and use of self-help services

Self-help type	Training and use of self-help services					
	Received training and used the services	**Received training and did not use the services**	**Did not receive training and used the services**	**Did not receive training and did not use the services**	**No response**	**Total**
Self-issue	36 (37.11%)	5 (5.16%)	23 (23.71%)	29 (29.90%)	4 (4.12%)	97 (100%)
Self-return	24 (24.74%)	4 (4.12%)	32 (33%)	33 (34.02%)	4 (4.12%)	97 (100%)

The results for staff using the self-issue services reflect the same trend as for students, one difference being the higher percentage (37.11%) of staff who received training and used the self-issue services versus 25.72% of students. More staff received training and used the services than those that did not receive training and did not use the services. In the case of students, the number of students who did not receive training and did not use the services exceeded that of students who received training and used the services.

The results for self-return services reflect the same trend as for students, although the differences between two of the training and usage categories were not as great as was the case with student users. The two categories were “Did not receive training and used the services” with 32 (33%) respondents and “Did not receive training and did not use the services” with 33 (34.02%) respondents. 33% of staff users did not receive training and used the self-return services in comparison with 24.74% of users who did receive training and used the self-return services. This might again be explained by studying Table 4.10, which indicates that a combined total of 87.72% of respondents rated ease

of use of the self-return services as 4 or 5 on the Likert scale. If the use of the self-return services is experienced as easy by respondents it explains this trend. The comments made by students also explain why, although staff respondents did not receive training, they nevertheless used the self-return services. Some students indicated that training was not necessary as the self-return services were quite easy to use with clear on-screen instructions.

4.10.3.4.3 Staff who were also Unisa students (total 72)

The results for the 72 staff who were also Unisa students are as follows:

Table 4.38 Staff who were also Unisa student users' training and use of self-help services

Self-help type	**Training and use of self-help services**					
	Received training and used the services	**Received training and did not use the services**	**Did not receive training and used the services**	**Did not receive training and did not use the services**	**No response**	**Total**
Self-issue	18 (25%)	2 (2.78%)	27 (37.5%)	22 (30.56%)	3 (4.16%)	72 (100%)
Self-return	10 (13.89%)	0	31 (43.06%)	28 (38.89%)	3 (4.16%)	72 (100%)

Interestingly, the results for staff who were also Unisa students indicated that those that did not receive training and used the self-issue and return services outnumbered the ones that had received training and used the self-issue and return services. A higher percentage of users also fell into the category "Did not receive training and used the services" than in the category "Did not receive training and did not use the services". This might be explained by studying Table 4.8 and Table 4.10 that indicate that 69.56% and 78.57% of respondents rated ease of use of the self-issue and return services as 4 or 5 respectively on the Likert scale. If respondents experienced the use of the self-

issue and return services as easy it explains this trend. The comments made by some staff who were also Unisa students also explains why, although these respondents did not receive training, they nevertheless used the self-issue and return services. Some staff who were also students indicated that training was not necessary as the self-issue and return services were quite easy to use with clear on-screen instructions.

4.10.4 Problems encountered with the use of the self-help circulation services

Information about the problems that occurred during the use of the RFID self-help circulation services was obtained from library self-help services users, circulation librarians and systems librarians.

The Pearson correlation was calculated as follows between each *problem* variable and the self-help use *satisfaction* variable for library users and library staff:

- Library users: correlation between each *problem* (Table 4.39 and 4.40) and self-help use *satisfaction* (Table 4.4 and Table 4.6).

- Library staff: correlation between each *problem* (Table 4.41) and *satisfaction* with self-help use (Table 4.5 and 4.7). The correlation was only calculated for circulation and systems librarians as the other library staff were not involve in any sense with the self-help circulation services.

The significance of the correlation between the above variables was found to be at the 0.01 level.

4.10.4.1 Problems encountered by library users

The responses of the users of the library self-help circulation services were analysed to see what types of problem were encountered. The assumption made was that if users of the library self-help circulation services encountered too many problems and types of problem, it would affect user satisfaction during the use of the RFID self-help circulation services.

The problems were analysed by tabulating them according to the three user categories: student, staff and staff who were also Unisa students. Furthermore, the different

problems were tabulated separately for self-issue and self-return services. The total number per problem category indicated how many users encountered the specific category of problem. It should be noted that one user could experience problems in more than one problem category.

4.10.4.1.1 Self-issue services problems

Table 4.39 Self-issue problems encountered by library users

Library user category	**Problems encountered (per problem category)**						
	Machine was not working	**Machine indicated a problem with user's university ID card**	**Machine did not accept the user's PIN**	**Problem with book**	**Machine indicated a problem with user's library account**	**Machine did not print due date slips**	**Tags were not desensitised by the machine**
Students (total 222)	96 (43.24%)	41 (18.47%)	32 (14.41%)	28 (12.61%)	15 (6.76%)	31 (13.96%)	25 (11.21%)
Staff (total 60)	35 (58.33%)	16 (26.23%)	20 (33.33%)	14 (23.33%)	3 (5%)	11 (18.33%)	9 (15%)
Staff who were also Unisa students (total 46)	21 (44.68%)	12 (25.53%)	13 (27.66%)	7 (15.22%)	3 (6.52%)	15 (32.61%)	11 (23.91%)

Table 4.39 (cont.) Self-issue problems encountered by library users

Library user category	No problems encountered (per problem category)						
	Machine was not working	**Machine indicated a problem with user's university ID card**	**Machine did not accept the user's PIN**	**Problem with book**	**Machine indicated a problem with user's library account**	**Machine did not print due date slips**	**Tags were not desensitised by the machine**
Students (total 222)	126 (56.76%)	181 (81.53%)	190 (85.59%)	194 (87.39%)	207 (93.24%)	191 (86.04%)	198 (88.79%)
Staff (total 60)	25 (41.67%)	45 (73.77%)	40 (66.67%)	46 (76.67%)	57 (95%)	49 (81.67%)	51 (85%)
Staff who were also Unisa students (total 46)	26 (55.32%)	35 (74.47%)	34 (72.34%)	39 (84.78%)	43 (93.48%)	31 (67.39%)	35 (76.09%)

It is clear that in most cases the number of user respondents that indicated problems experienced per problem category is far fewer than the ones that experienced no problems per problem category. There is one exception in the case of students, namely, the problem category "Machine out of order". For this category, the difference is not that big in comparison with the other problem categories, with 96 (43.24%) respondents

indicating that problems were experienced and 126 (56.76%) indicating that no problems were experienced.

Staff user respondents experienced more problems than no problems in only one problem category – “Machine out of order” with 35 (58.33%) encountering problems in this category compared to 25 (41.67%) encountering no problems in this category. For the other staff problem categories, the difference between experiencing problems and experiencing no problems is quite large. Far more staff user respondents indicated that they did not experience a lot of problems in these categories than those that experienced a lot of problems.

The difference between the “Machine out of order” category with regard to problems experienced and no problems experienced is also not that large for staff who were also Unisa students in comparison to the other problem categories. 26 (55.32%) indicated no problems experienced while 21 (44.68%) experienced problems. For the other categories, the difference between problems encountered and no problems encountered are also large for staff who were also Unisa students. Far more of these respondents indicated that they did not experience many problems in these categories than those that experienced a lot of problems.

4.10.4.1.2 Self-return services problems

Table 4.40 Self-return problems encountered by library users

Library user category	**Problems encountered (per problem category)**			
	Machine was not working	**Problem with book**	**Machine did not print receipts**	**Books could not be returned as return bin was full**
Students (total 189)	91 (47.64%)	24 (12.7%)	42 (22.22%)	6 (3.17%)
Staff (total 57)	33 (56.9%)	14 (24.14%)	16 (28.07%)	5 (8.77%)

Table 4.40 (cont.) Self-return problems encountered by library users

Library user category	**Problems encountered (per problem category)**			
	Machine was not working	**Problem with book**	**Machine did not print receipts**	**Books could not be returned as return bin was full**
Staff who were also Unisa students (total 42)	21 (50%)	7 (16.67%)	18 (42.86%)	3 (7.14%)
No problems encountered (per problem category)				
Students (total 189)	100 (52.36%)	165 (87.3%)	147 (77.78%)	183 (96.83%)
Staff (total 57)	25 (43.1%)	44 (75.86%)	41 (71.93%)	52 (91.23%)
Staff who were also Unisa students (total 42)	21 (50%)	35 (83.33%)	24 (57.14%)	39 (92.86%)

It is clear that in most cases the number of respondents who indicated no problems experienced per problem category were far more than those who experienced problems per problem category. This is true for the students, staff and staff who were also Unisa students categories. In the case of students, however, the “Machine out of order” problem category is also the only category where the difference is not that big in comparison with the other problem categories, with 91 (47.64%) respondents who indicated problems experienced and 100 (52.36%) who indicated that no problems were experienced.

Staff experienced more “problems” than “no problems” in only one problem category – “Machine out of order” with 33 (56.9%) encountering problems in this category compared to 25 (43.1%) encountering no problems in this category. For the other staff problem categories, the difference between experiencing problems and experiencing no problems is much larger. Far more staff user respondents indicated that they did not experience a lot of problems in these categories than those that experienced a lot of problems.

In the staff who were also Unisa students category, the ratio of the respondents indicating they experienced problems to those who experienced no problems in the “Machine out of order” problem category is 50:50. For the other staff who were also Unisa students problem categories, the difference between experiencing problems and experiencing no problems is quite large. Far more respondents in this user category indicated that they did not experience a lot of problems in these categories than those that experienced a lot of problems.

Whichever way one interprets the statistics, it does not mean that because in most cases respondents encountered fewer problems per category that such problems are not a factor. In fact, they are a factor in the sense that if most respondents do not experience many problems, it at least indicates that the RFID self-help services do not present many problems that would have affected user satisfaction with the self-help services.

4.10.4.2 Problems encountered by library staff: circulation librarians and systems librarians (26 in total)

The circulation librarians’ and systems librarians’ responses concerning which problems they encountered with the use of the RFID self-help circulation services are tabulated below as the total percentage of staff responses to a specific problem. The circulation librarians’ responses are based on the problems they encountered while assisting library users with the use of the self-help services. The systems librarians’ responses are based on which problems they encountered during maintaining and support of the self-help circulation services and during integration of the RFID self-help circulation services and the LMS. The Likert scale method of analysing this data was used to indicate how negatively library staff experienced the influence of each problem on the

self-help circulation services. A rating of 1 on the scale was “Very negative” and 5 was “Not negative at all”. Negativity was measured by the frequency with which the problem occurred, which was an estimate by each staff member.

Table 4.41 Self-help circulation services problems encountered by library staff

Rating on Likert scale	**Problems encountered (per problem category) Total 26 respondents**					
	Self-issue machine was not working (25 respondents)	**Self-return machine was not working (24 respondents)**	**Problem with book during self-issuing (24 respondents)**	**Problem with book during self-returning (24 respondents)**	**Self-issue machine did not print due date slips (23 respondents)**	**Self-return machine did not print receipts (23 respondents)**
1	3 (12%)	2 (8.33%)	2 (8.33%)	2 (8.33%)	1 (4.35%)	2 (8.7%)
2	5 (20%) 1+2= 32%	6 (25%) 1+2= 33.33%	6 (25%) 1+2= 33.33%	7 (29.17%) 1+2= 37.5%	6 (26.09%) 1+2= 30.44%	4 (17.39%) 1+2= 26.09%
3	5 (20%)	3 (12.5%)	6 (25%)	6 (25%)	5 (21.74%)	5 (21.74%)
4	4 (16%)	5 (20.83%)	7 (29.17%)	6 (25%)	7 (30.44%)	9 (39.13%)
5	8 (32%) 4+5= 48%	8 (33.33%) 4+5= 54.16%	3 (12.5%) 4+5= 41.67%	3 (12.5%) 4+5= 37.5%	4 (17.39%) 4+5= 47.83%	3 (13.04%) 4+5= 52.17%

Table 4.41 (cont.) Self-help circulation services problems encountered by library staff

Rating on Likert scale	**Problems encountered (per problem category)** **Total 26 respondents**				
	Self-issue machine indicated a problem with user's library account (23 respondents)	**Self-issue machine indicated a problem with user's university ID card (23 respondents)**	**Self-issue machine did not accept user's PIN (24 respondents)**	**User not allowed through security gates after self-issue (24 respondents)**	**Books could not be returned as return bin was full (24 respondents)**
1	5 (21.74%)	4 (17.39%)	2 (8.33%)	3 (12.5%)	3 (12.5%)
2	3 (13.04%) 1+2= 34.78%	7 (30.44%) 1+2= 47.83%	9 (37.5%) 1+2= 45.83%	5 (23.83%) 1+2= 36.33%	6 (25%) 1+2= 37.5%
3	10 (43.48%)	4 (17.39%)	4 (16.67%)	7 (29.17%)	5 (20.83%)
4	1 (4.35%)	3 (13.04%)	7 (29.17%)	3 (12.5%)	4 (16.67%)
5	4 (17.39%) 4+5= 21.74%	5 (21.74%) 4+5= 34.78%	2 (8.33%) 4+5= 37.5%	6 (25%) 4+5= 37.5%	6 (25%) 4+5= 41.67%

From the statistics in Table 4.41 it is clear that the circulation librarians' and systems librarians' experiences with the occurrence of self-help circulation services problems do not confirm the findings for all problem categories as encountered by library users in Table 4.39 and 4.40.

The analysis of the statistics in Table 4.41 was performed by adding ratings 1 and 2 as a reflection of high frequency of problems and, hence, high negativity as experienced by library staff. Ratings 4 and 5 were added as a reflection of low frequency of problems and, hence, low negativity as experienced by library staff.

In Tables 4.39 and 4.40, which indicate library users' experience with problems, the difference between the number of users (students, staff and staff who were also Unisa students) who experienced problems and those who did not experience problems in the category "Machine out of order" for self-issue and self-return is not that large in comparison with the other problem categories. The same is not true for the circulation librarians and systems librarians, as the difference between those that experienced a high frequency of problems in all the problem categories and those that did not is not that large in comparison to the library users' experiences.

From Table 4.41 it is clear that the circulation and systems librarians' responses for the problem category "Problem with book during self-returning" are equal, with 37.5% for both a high frequency of problems and a low frequency of problems experienced. For all library user categories, the far greater majority did not experience many problems in this problem category.

Circulation and systems librarians' responses for the category "Self-issue machine indicated problem with patron library account" do not confirm the findings in Table 4.39. This table reveals that far more user respondents indicated that they did not encounter a problem with their account than user respondents who indicated they did encounter problems. According to the staff responses in Table 4.41, more library staff indicated that they experienced a higher frequency of problems – eight (34.78%) than staff who indicated that they experienced a lower frequency of problems – five (21.74%).

For the category "Self-issue machine indicated there is a problem with patron university ID card", the circulation and systems librarians' responses in Table 4.41 also do not confirm the findings in Table 4.39. In this table far more respondents indicated that they did not encounter a problem with their patron university card than respondents that indicated they did encounter problems. Table 4.41 shows that the majority of circulation and systems librarians indicated that they encountered more problems – 11 (47.83%) than staff who indicated that they did not encounter many problems – eight (34.78%).

The same is true for the category “Self-issue machine did not accept patron’s PIN”, where the circulation and systems librarian respondents’ results did not confirm the findings of the self-issue services users’ results. Table 4.41 indicates that the majority of circulation and systems librarians experienced more problems than those that did not experience many problems – 11 (45.83%) versus nine (37.5%).

For the other problem categories in Table 4.41, the statistics are in line with the responses from users in Tables 4.39 and 4.40. However, the categories in Table 4.41 do not reflect such a big difference between a low frequency of problems and a high frequency of problems.

4.10.5 Two different RFID systems being used at Unisa Library Services

Library staff in different sections were asked whether any problems were experienced as a result of the use of two different RFID self-help circulation systems. The results are as follows:

Table 4.42 Library staff’s experience with two different RFID systems

Library staff category	**Problems with two different RFID systems**			
	Yes	**No**	**No answer**	**Total**
Acquisitions tagging staff	0	4 (100%)	0	4 (100%)
Circulation librarians	3 (12.5%)	15 (62.5%)	6 (25%)	24 (100%)
Shelving staff	0	10 (100%)		10 (100%)

Table 4.42 (cont.) Library staff's experience with two different RFID systems

Library staff category	Problems with two different RFID systems			
	Yes	No	No answer	Total
Delivery staff	2 (66.67%)	1 (33.33%)	0	3 (100%)
Systems librarians	2 (100%)	0	2 (100%)	2 (100%)

From Table 4.42 it is clear that for all four acquisitions tagging staff (100%), all the shelving staff and a majority of circulation librarians – fifteen (62.5%), the use of the two systems did not pose a problem. However, the majority of delivery staff – two (66.67%) identified it as a problem. Both the systems librarians (100%) also indicated that two RFID systems are problematic. As 12.5% of circulation librarians, 66.67% of delivery staff and 100% of systems librarians indicated that it is problematic, these statistics cannot be ignored.

Even though only seven library staff members out of a total of 31 staff from all three sections indicated this as problematic, implementing two systems must still be taken into account during decision-making on RFID system implementation.

The comments by library staff regarding any problems experienced due to the use of two RFID systems can be summarised as follows:

One of the circulation librarians indicated the different procedures for the two types of RFID self-help machines and staff workstations as problematic as it made the use of the two types of equipment more difficult to get used to.

The comments of shelving staff indicate that they had only one new RFID staff workstation and one old RFID sorter machine. The staff workstation and the sorter machine were used for different tasks, and thus they did not experience any problems with using the two different systems.

The delivery section had two different types of RFID staff workstation. They each had a new staff workstation as well as one old type. However, the old staff workstation was not used by any of the staff. The difference between the two workstations was also described as too big to make the use of the old type feasible.

Systems librarians indicated that their biggest problem with having to support and maintain equipment and software for two different systems was the different reporting procedures to two different RFID companies. One of the two staff members indicated that maintaining and supporting two different systems, one old and one new, was difficult as the systems procedures and functioning differed a great deal.

The Pearson correlation was calculated between the variables *two RFID systems* and library staff *satisfaction with use* of the RFID systems. The significance of the correlation was calculated and found to be at the 0.01 level between Table 4.42 above – *two RFID systems* and Table 4.5, 4.7, 4.52 and 4.58 – *satisfaction with use*.

4.10.6 Accessibility of self-help services

Library users were asked whether the self-help machines were placed in an easily accessible place. The question was only posed to library users who used the self-help services. The reason for this was that as they used the self-help services they would most probably be able to answer the question. The Likert scale method was used to analyse data on how accessible respondents found the self-help services.

The Pearson correlation was calculated between the variables *accessibility* of self-help circulation services and library user *satisfaction with use* of the self-help circulation services. The significance of the correlation was calculated and found to be at the 0.01 level between Table 4.43 and 4.44 below – *accessibility* and Table 4.4 and Table 4.6 – *satisfaction with use*.

4.10.6.1 Accessibility of self-issue services

Library users were asked whether the self-issue machines were placed in an easily accessible place. Accordingly, the Likert scale was used to analyse the data on how accessible respondents found the self-issue services to be. The scale is from 1 “Not accessible at all” to 5 “Very accessible”. The results are as follows:

Table 4.43 Accessibility of self-issue services as rated by self-issue users

Library user category	**Rating on Likert scale**						
	1	2	3	4	5	No answer	Total
Students	4 (1.8%)	10 (4.5%)	46 (20.72%)	66 (29.73%)	87 (39.2%)	9 (4.05%)	222 (100%)
Staff	0	4 (6.67%)	12 (20%)	19 (31.67%)	25 (41.66%)	0	60 (100%)
Staff who were also Unisa students	0	3 (6.52%)	4 (8.7%)	16 (34.78%)	23 (50%)	0	46 (100%)

From Table 4.43 the following is clear:

87 (39.2%) student respondents rated accessibility as 5 on the scale (very accessible), 66 (29.73%) students rated accessibility as 4 on the scale and a combined total of 153 (68.93%) student respondents rated accessibility as 4 or 5 on the scale. On the reverse side of the scale, only four (1.8%) students rated accessibility as 1 on the scale (not accessible at all), ten (4.5%) students rated accessibility as 2 on the scale and a combined total of 14 (6.3%) student respondents rated accessibility on 1 or 2 on the scale. 46 (20.72%) students' responses were neutral – 3 on the scale, while nine (4.05%) respondents who used the self-issue services did not answer this question.

25 (41.66%) staff respondents rated accessibility as 5 on the scale and 19 (31.67%) rated it as 4 on the scale, with a combined total of 44 (73.33%) respondents rating accessibility as 4 or 5 on the scale. No staff respondent rated accessibility as 1 and four (6.67%) rated it as 2. A combined total of four (6.67%) respondents rated accessibility as 1 or 2 on the scale, while 12 (20%) respondents were neutral.

23 (50%) respondents who were both staff and Unisa students rated accessibility a 5 on the scale, 16 (34.78%) rated it as 4 and a combined total of 39 (84.78%) respondents rated it as 4 or 5. No respondents rated accessibility as 1 and three (6.52%) chose a rating of 2. A combined total of three (6.52%) respondents rated accessibility as 1 or 2 on the scale and four (8.7%) respondents were neutral in this regard.

It is clear from the above that for all user categories there was general agreement that placement of the self-issue machines was easily accessible for use. This is therefore a factor that needs to be considered as the reverse will have the effect that library users will not be satisfied with the use of the self-issue services. Therefore, poor accessibility will influence the effectiveness of the RFID self-issue services.

4.10.6.2 Accessibility of self-return services

Table 4.44 Accessibility of self-return services as rated by self-return users

Library user category	**Rating on Likert scale**						
	1	2	3	4	5	No answer	Total
Students	1 (0.53%)	8 (4.23%)	41 (21.69%)	44 (23.28%)	92 (48.68%)	3 (1.59%)	189 (100%)
Staff	1 (1.75%)	1 (1.75%)	2 (3.51%)	24 (42.11%)	29 (50.88%)	0	57 (100%)
Staff who were also Unisa students	0	1 (2.38%)	5 (11.91%)	14 (33.33%)	22 (52.38%)	0	42 (100%)

92 (48.68%) student respondents rated accessibility as 5 on the scale (very accessible), 44 (23.28%) students rated it as 4 and a combined total of 136 (71.96%) rated it as 4 or 5. On the reverse side of the scale, only one (0.53%) student rated accessibility as 1 (not accessible at all) and eight (4.23%) students rated accessibility as 2. A combined

total of nine (4.76%) student respondents rated accessibility as 1 or 2, while 41 (21.69%) students' responses were neutral – 3 on the scale. Three (1.59%) respondents used the self-return services but did not answer this question.

29 (50.88%) staff respondents rated accessibility as 5 on the scale, 24 (42.11%) rated it as 4 and a combined total of 53 (92.99%) respondents rated it as 4 or 5. One (1.75%) staff respondents rated accessibility as 1 on the scale and one (1.75%) rated it as 2, while a combined total of two (3.5%) respondents rated accessibility as 1 or 2 and two (3.51%) respondents were neutral on accessibility.

22 (52.38%) respondents who were both staff and Unisa students rated accessibility as 5 on the scale, 14 (33.33%) rated it as 4 and a combined total of 36 (85.71%) respondents rated it as 4 or 5. No respondents rated accessibility as 1 and one (2.38%) chose a rating of 2, thus a combined total of one (2.38%) respondent rated accessibility as 1 or 2 on the scale. Five (11.91%) respondents were neutral regarding accessibility – 3 on the scale.

It is clear from the above that for all library user categories there was general agreement that the placement of self-return machines was easily accessible for use. This is therefore a factor that needs to be considered as the reverse will have the effect that library users will not be satisfied with the use of self-return services. Therefore, poor accessibility will influence the effectiveness of the RFID self-return services.

4.10.7 Handling books returned by library users using the self-return services at a branch library that is not the owner library

Circulation librarians were asked how they handled books that were returned at a Unisa library that does not belong to that specific library using the self-return services. The reason for this question was to establish what methods librarians used to identify books from other Unisa libraries that were returned via the specific library's self-return services. The responses were summarised as follows:

Most books belonging to other Unisa libraries cannot be identified as belonging to a specific library as there is no reliable information in the books for that purpose. The books must therefore also be returned on the LMS in order to determine the owner library. This means that the return function is duplicated. Before the RFID

implementation at Unisa Library Services, books were returned at the manual circulation desk and where relevant were identified by the LMS as belonging to another library. Following the RFID implementation, library users return books via the self-return services. Circulation librarians then must take the same books and return them again on the LMS for identification as belonging to a different Unisa library. The same is true for books that have a status of “On hold” as they can only be identified by being returned again on the LMS.

Systems librarians indicated that the only way to cater for books to be sorted per library by the self-return services would be to have an RFID sorter for each library’s self-return machine. However, RFID sorters are expensive and each Unisa library with self-return services will need to have at least one. RFID sorters are able to identify each Unisa library’s books and also books “On hold”.

4.10.8 Privacy concerns regarding the use of self-issue services

A question was posed to library user respondents as to whether they felt that the privacy of their personal information might have been compromised while using the self-issue services. This question was only posed to library users who used the self-issue services. The reason for this was that because they used the machines they would probably be most able to answer the question.

The results are analysed in Table 4.45 below:

Table 4.45 Privacy concerns while using the self-issue services

Library user category	Privacy concerns			
	Yes	**No**	**No answer**	**Total**
Students	30 (13.51%)	179 (80.63%)	13 (5.86%)	222 (100%)
Staff	4 (6.67%)	55 (91.66%)	1 (1.67%)	60 (100%)
Staff who were also Unisa students	7 (15.22%)	37 (80.43%)	2 (4.35%)	46 (100%)

It is clear from Table 4.45 that for all three user categories the majority of library self-issue services users did not feel that any private information might be compromised while using the services. This seems therefore to be a factor that will have limited influence on RFID self-issue services. However, it must still be taken into consideration as there were still 12.5% self-issue user respondents who did have privacy concerns.

The Pearson correlation was calculated between the variables *privacy concerns* during use of self-issue services and library user *satisfaction with use* of the self-help circulation services. The significance of the correlation was calculated and found to be at the 0.01 level between Table 4.45 above – *privacy concerns* and Table 4.4 – *satisfaction with use*.

4.10.9 Change in circulation librarians' roles and responsibilities

Circulation librarians were asked if their roles or responsibilities changed after implementation of the RFID self-help circulation services. This is illustrated in Figure 4.6:

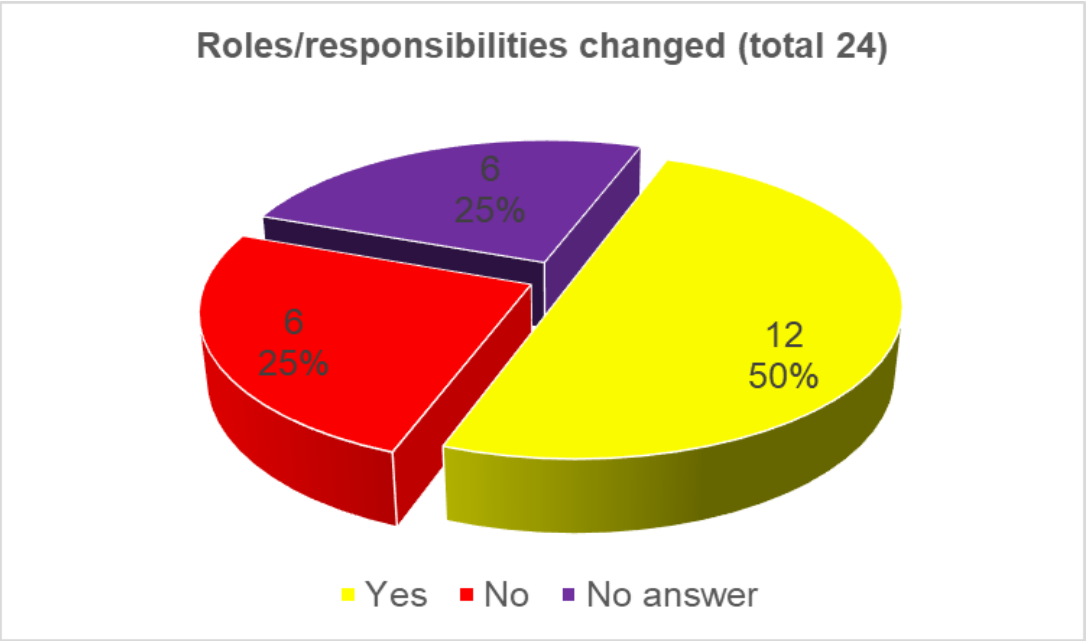

Figure 4.6 Roles or responsibilities changed (circulation librarians)

12 (50%) of circulation librarians indicated that they experienced a change in their roles or responsibilities. Six (25%) indicated that they did not experience a change in their roles and responsibilities; another six (25%) did not answer the question.

From the qualitative responses with this question it is clear that the majority of circulation librarians' roles or responsibilities changed as follows:

Circulation librarians indicated that they are more involved in training library users with retrieving information from the online library catalogue and e-resources. They are more involved in assisting library users on how to use the library. They also became involved in training library users in using the RFID self-help circulation services.

The Pearson correlation was calculated between the variables *roles/responsibilities changed* after implementation of self-help services and circulation librarians' *satisfaction with use* of the self-help circulation services. The significance of the correlation was

calculated and found to be at the 0.01 level between Figure 4.6 above – *change in roles/responsibilities* and Table 4.5 and 4.7 – *satisfaction with use.*

4.11 ADVANTAGES AND DISADVANTAGES OF USING THE RFID SELF-HELP CIRCULATION SERVICES

Advantages and disadvantages of using the RFID self-help circulation services were analysed.

4.11.1 Time saved during use of the RFID self-help circulation services

Library user respondents who used the self-help services were asked separate questions on whether they saved time while using the self-issue and self-return services.

The Pearson correlation was calculated between the variables *time saved* by using the self-help circulation services and *satisfaction with use* of the self-help circulation services. The significance of the correlation was calculated and found to be at the 0.01 level between Table 4.46 and Table 4.47 below – *time saved* and Table 4.4 and Table 4.6 – *satisfaction with use*.

4.11.1.1 Time saved during the use of self-issue services by library users

Respondents who used the self-issue services were asked whether they saved any time by using the system instead of using the manual circulation desk issue services. The results are as follows:

Table 4.46 Time saved by library users using the self-issue services

Library user category	**Time saved**			
	Yes	**No**	**No answer**	**Total**
Students	197 (88.74%)	24 (10.81%)	1 (0.45%)	222 (100%)
Staff	48 (80%)	11 (18.33%)	1 (1.67%)	60 (100%)

Table 4.46 (cont.) Time saved by library users using the self-issue services

Library user category	Time saved			
	Yes	**No**	**No answer**	**Total**
Staff who were also Unisa students	41 (89.13%)	4 (8.7%)	1 (2.17%)	46 (100%)

197 (88.74%) student respondents, 48 (80%) staff respondents and 41 (89.13%) staff members who were also Unisa students indicated that they saved time by using the self-issue services.

Hence, a majority of all three library user respondent categories indicated that they saved time by using the self-issue services. Saving time can therefore be seen as an advantage of using RFID self-issue services.

4.11.1.2 Time saved during the use of self-return services by library users

Respondents who used the self-return services were asked whether they felt this saved time in comparison to the use of the manual circulation desk return services. The results are as follows:

Table 4.47 Time saved by library users using the self-return services

Library user category	Time saved			
	Yes	**No**	**No answer**	**Total**
Students	179 (94.71%)	7 (3.7%)	3 (1.59%)	189 (100%)
Staff	50 (87.72%)	6 (10.53%)	1 (1.75%)	57 (100%)

Table 4.47 (cont.) Time saved by library users using the self-return services

Library user category	Time saved			
	Yes	No	No answer	Total
Staff who were also Unisa students	38 (90.48%)	4 (9.52%)	0	42 (100%)

179 (94.71%) student respondents, 50 (87.72%) staff respondents and 38 (90.48%) staff members who were also Unisa students indicated that they saved time by using the self-return services.

Hence, the largest majority of all three respondent categories indicated that they saved time by using the self-return services. Saving time can therefore be seen as an advantage of using RFID self-return services.

4.11.2 Using RFID tags in library material items

According to the literature study, Chapter 2, Section 2.4.1 RFID tags in books make the circulation of items easier than a manual system that uses barcodes.

However, at the same time the literature indicates that one of the disadvantages of using RFID tags lies in the use of the tags for security purposes, as mentioned in Chapter 2, Section 2.4.2.

4.11.2.1 Opinions on the use of RFID tags versus barcodes during issue and return

Circulation librarian respondents were asked whether they felt that using tags made the circulation of library material easier than when barcodes were used. The results are displayed in Figure 4.7 below:

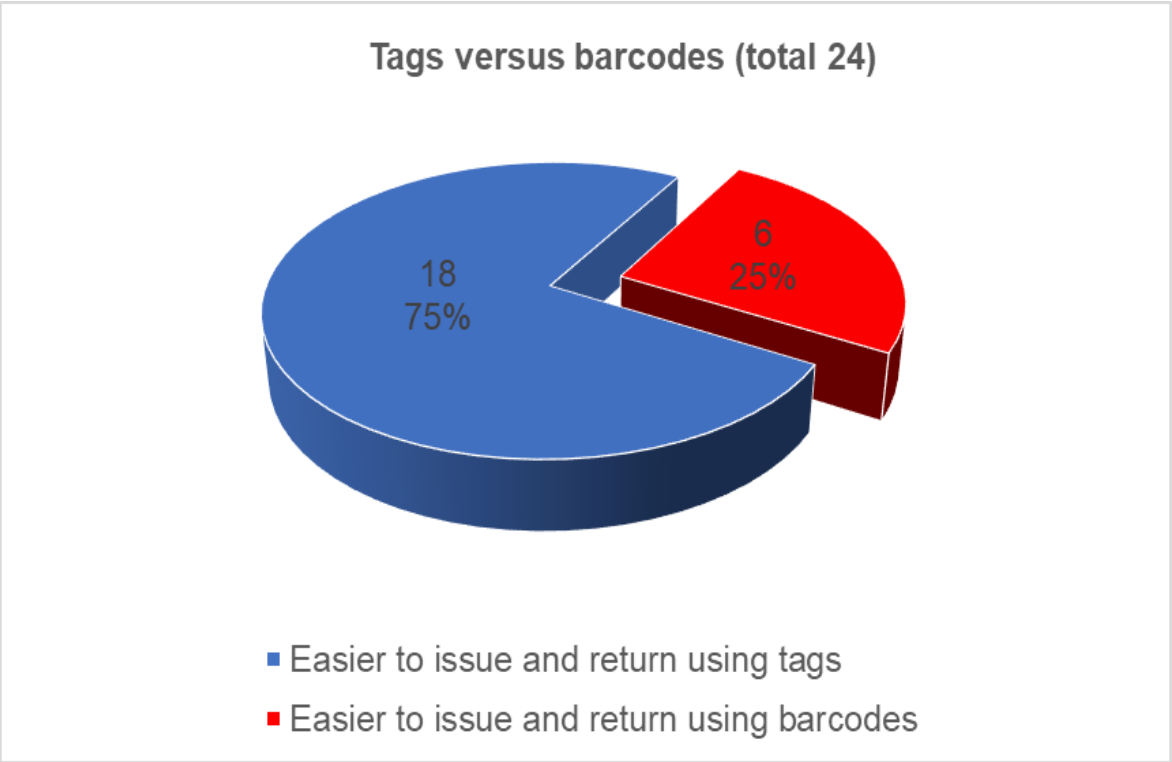

Figure 4.7 RFID tags versus barcodes for circulation (circulation librarians)

The greater majority – 18 (75%) respondents confirmed that tags made circulation easier than barcodes. The use of RFID tags during self-issue or return is therefore an advantage of RFID self-help circulation services.

The Pearson correlation was calculated between the variables *ease of using tags* by using the self-help circulation services and *satisfaction with use* of the self-help circulation services. The significance of the correlation was calculated and found to be at the 0.01 level between Figure 4.6 above – *ease of using tags* and Table 4.5 and Table 4.7 – *satisfaction with use*.

Delivery staff respondents were also asked whether they felt that using tags made the circulation of library material easier than when barcodes were used. The results are displayed in Figure 4.8 below:

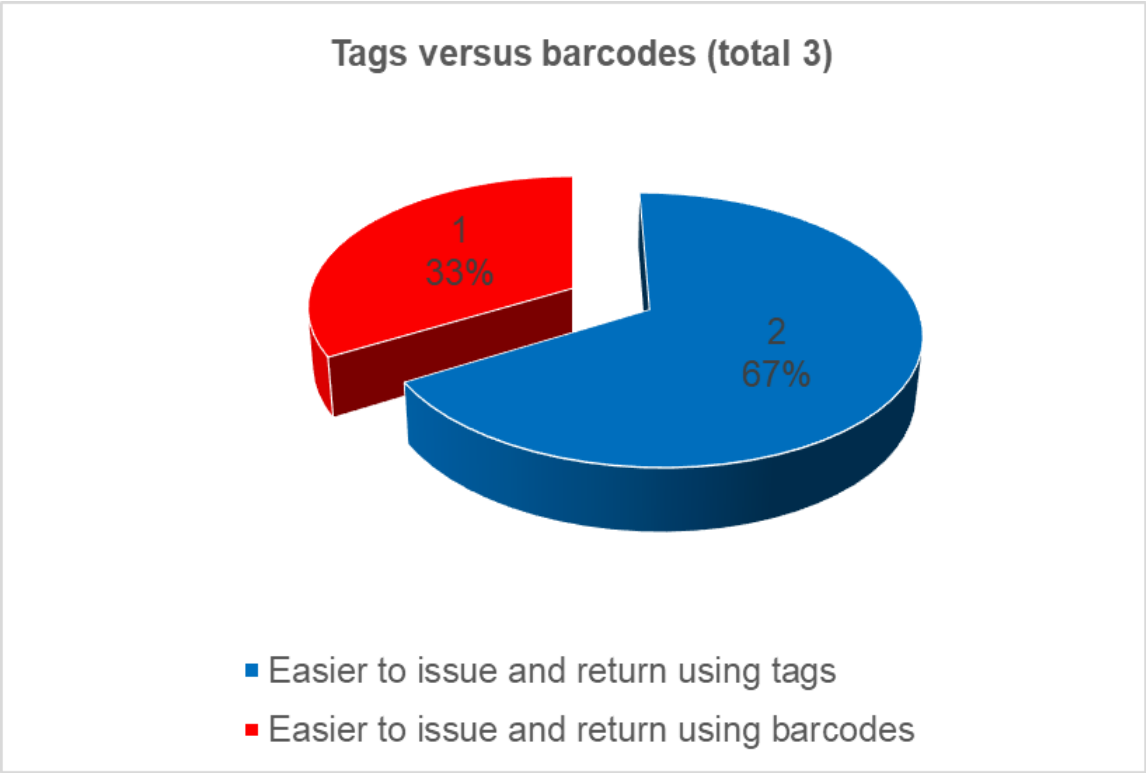

Figure 4.8 RFID tags versus barcodes for circulation (delivery staff)

The majority of delivery staff – two (67%) respondents, confirmed that tags made circulation easier than barcodes. The use of RFID tags during self-issue or return is therefore an advantage of RFID self-help circulation services.

The Pearson correlation was calculated between the variables *ease of using tags* by using the RFID staff workstation and *satisfaction with use* of the staff workstation during circulation. The significance of the correlation was calculated and found to be at the 0.01 level between Figure 4.8 above – *ease of using tags* and Table 4.52 – *satisfaction with use*.

4.11.2.2 The use of tags for security purposes

During the literature study in Chapter 2, Section 2.4.2 it was found that opinions differ with regard to RFID tags being used for securing library material items against theft. The majority of opinions in the literature indicated that using tags for security purposes is flawed. This is confirmed in Tables 4.17, 4.20, 4.23, 4.26, 4.29 and 4.32 where the high occurrence of tags being removed or damaged since implementation was discussed. It was also found that between January and December 2015 tags were still being removed or damaged every month.

This is confirmation of the findings in the literature study that indicated that the use of tags for security purposes are not an advantage of RFID tags.

4.11.3 Renewal of books using the RFID self-issue services

The circulation librarian and systems librarian respondents were asked whether books can be renewed using the RFID self-issue services. The results for circulation librarians are displayed in Figure 4.9 below:

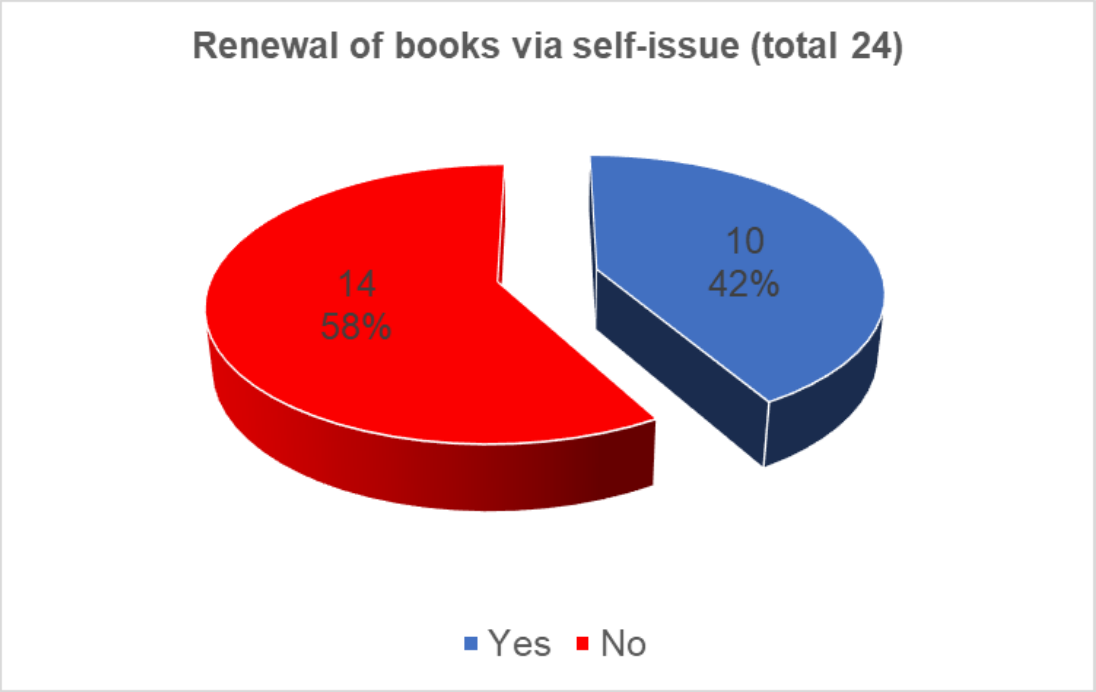

Figure 4.9 Self-issue renewal of books (circulation librarians)

Ten (42%) of the respondents indicated that books can be renewed using the self-issue services while 14 (58%) indicated it is not possible. Strictly speaking, it is not possible to renew books using the self-issue services. Self-issue services should cater for renewals by allowing the user to access their library patron account on the machine and then choosing the books they want to renew without having the books available. A type of renewal can be done by issuing the already issued book again using the self-issue services. To issue the book again, the user must have the book with him/her at the self-issue services.

During interviews with the two systems librarians, it was established that the SIP2 protocol of the LMS does not cater for renewals. This can therefore not be seen as an advantage in the case of Unisa Library Services.

The 42% of circulation librarian respondents that indicated that books can be renewed using the self-issue services seems to indicate a lack of sufficient formal or in-service training regarding the functionality of these services.

The Pearson correlation was calculated between the variables *renewal of books* using the self-issue services and *satisfaction with use* of the self-help circulation services. The significance of the correlation was calculated and found to be at the 0.01 level between Figure 4.9 above – *renewal of books* and Table 4.5 – satisfaction *with use*.

4.11.4 RFID self-help circulation services and audio-visual material

Questions were posed to circulation librarians and systems librarians as to whether audio-visual material could be issued or returned using the self-help services. The results are below:

Table 4.48 Audio-visual material and RFID self-help circulation services (circulation librarians)

Self-help functionality	**Self-help services and audio-visual material**			
	Yes	**No**	**No answer**	**Total**
Audio-visual material issued via self-issue services	3 (12.5%)	19 (79.17%)	2 (8.33%)	24 (100%)
Audio-visual material returned via self-return services	6 (25%)	15 (62.5%)	3 (12.5%)	24 (100%)

The majority of circulation librarians – 19 (79.17%) indicated that audio-visual material was not issued using the self-issue services. Respondents gave reasons why it should not be issued this way, which indicates that during training they had been made aware why audio-visual material should not be issued in this way.

The systems librarians also indicated specific reasons why it was decided not to issue audio-visual material using self-issue services. Such material is issued via the manual circulation desk as any accompanying material must be checked to make sure it is present. There is also the problem that the data on the audio-visual material might be damaged by the electromagnetic field created by the desensitising unit of the self-issue machine. This can therefore not be seen as an advantage. At Muckleneuk library there is another reason for this: audio-visual material is kept in a separate audio-visual section and it is therefore easier to assist the library users at the audio-visual section's manual circulation desk. The fact that 12.5% of circulation librarians indicated that audio-visual material was issued using the self-issue services seems to indicate a lack of sufficient formal or in-service training.

The majority of circulation librarians – 15 (62.5%) indicated that audio-visual material was not returned using the self-return services. Circulation librarians and systems librarians indicated that the main reasons for not returning this type of material via the self-return services is to prevent any damage to the material when it is dropped through the self-return services machine into the return bin. Another reason given was that it must be returned at the manual circulation desk to ensure that it is checked for completeness regarding accompanying material. This can therefore not be seen as an advantage. In addition, 25% of respondents indicated that audio-visual material could be returned using the self-return services. As with the self-issue services, this might point to a lack of sufficient formal or in-service training.

For the use of both self-issue and return services circulation librarians indicated that users were generally warned against the self-issuing or returning of audio-visual material via notices in this respect. Users were also informed during training not to use the self-services to issue or return audio-visual material.

The Pearson correlation was calculated between the variables *audio-visual material issued and returned* by using the self-help circulation services and *satisfaction with use* of the self-help circulation services. The significance of the correlation was calculated and found to be at the 0.01 level between Figure 4.48 above – *self-issue and return* of audio-visual material and Table 4.5 and Table 4.7 – *satisfaction with use*.

4.11.5 RFID self-help circulation services and the simultaneous issue or return of more than one book

Systems librarians and the circulation librarians responsible for assisting library users were asked whether more than one book could be issued or returned simultaneously using the self-help services. The results are displayed in Table 4.49 below:

Table 4.49 Simultaneous self-issue or return of more than one book (circulation librarians)

Self-help functionality	**Self-issue and return of more than one book simultaneously**			
	Yes	**No**	**No answer**	**Total**
Simultaneous issuing of more than one book via self-issue services	5 (20.83%)	19 (79.17%)	0	24 (100%)
Simultaneous returning of more than one book via self-return services	3 (12.5%)	19 (79.17%)	2 (8.33%)	24 (100%)

19 (79.17%) of the circulation librarian respondents indicated that more than one book cannot be simultaneously issued using the self-issue services. The self-issue services include instructions that show that only one book can be issued at a time. There is also a graphic illustration on the self-issue services machine monitor which indicates that only one book can be returned at a time. Nevertheless, five (20.83%) respondents indicated that more than one book could be issued simultaneously. However, the two systems librarian respondents commented that it is not possible as all books would be desensitised but not all would necessarily be issued on the LMS. Hence, this is not possible due to a technological limitation. This is therefore not an advantage. The five (20.83%) circulation librarians who indicated that it is possible most probably had insufficient knowledge resulting from a lack of training or insufficient training whether it be formal or in-service training.

19 (79.17%) of the circulation librarian respondents indicated that only one book at a time can be returned using the self-return services. There is a graphic illustration on the monitor of the self-return services machine which indicates that only one book can be returned at a time. Nevertheless, three (12.5%) circulation librarian respondents indicated that more than one book could be returned simultaneously. This lack of knowledge is most probably an indication of a lack of sufficient formal or in-service training.

Simultaneous issuing and returning of books respectively by using the RFID self-help services is therefore not an advantage.

The Pearson correlation was calculated between the variables *simultaneous issue or return* of more than one book by using the self-help circulation services and *satisfaction with use* of the self-help circulation services. The significance of the correlation was calculated and found to be at the 0.01 level between Figure 4.49 above – *simultaneous self-issue or return* of more than one book and Table 4.5 and Table 4.7 – *satisfaction with use*.

4.11.6 RFID self-help circulation services and desensitising and sensitising of EM security strips in books

Systems librarians and the circulation librarians responsible for assisting library users were posed two questions regarding self-help services and desensitising and sensitising of EM security strips in books. The questions were:

- Are the self-issue services able to desensitise the EM security strips in books on self-issue?
- Are the self-return services able to sensitise the EM security strips in books on self-return?

The results are indicated in Table 4.50 as follows:

Table 4.50 Desensitising and sensitising EM security strips using RFID self-help circulation services (circulation librarians)

Self-help functionality	**Self-help services and desensitising and sensitising**			
	Yes	**No**	**No answer**	**Total**
Self-issue services can desensitise security strips	19 (79.17%)	5 (20.83%)	0	24 (100%)
Self-return services can sensitise security strips	8 (33.33%)	16 (66.67%)	0	24 (100%)

19 (79.17%) of the circulation librarian respondents who assist users were aware that self-issue services can desensitise EM security strips in books during self-issue. However, five (20.83%) respondents were not aware of the fact. Systems librarians confirmed this is part of self-issue services functionality. This is therefore an advantage.

Sixteen (66.67%) of the circulation librarian respondents assisting users indicated that the self-return services do not have the ability to sensitise the security strips in books. This was confirmed by the systems librarians. This is therefore not an advantage. Eight (33.33%) of the respondents, however, indicated that the self-return services have the ability to sensitise the EM security strips in books. Again, it appears that some of the circulation librarians did not have knowledge of this lack of functionality.

The Pearson correlation was calculated between the variables *desensitising or sensitising* of security strips by using the self-help circulation services and *satisfaction with use* of the self-help circulation services. The significance of the correlation was calculated and found to be at the 0.01 level between Figure 4.50 above – *desensitising or sensitising* and Table 4.5 and Table 4.7 – *satisfaction with use*.

4.11.7 Inventory control

According to the literature study in Chapter 2, Section 2.4.1 the use of RFID tags in library material should render inventory control faster and easier.

The three inventory control librarians were asked a question to establish whether inventory control was rendered more efficient and faster through the RFID technology. The results are as follows:

Inventory control was not rendered more efficient. Since the implementation of RFID at Unisa Library Services different companies have been approached to find a solution for inventory control using an RFID scanner and RFID tags but none could supply a scanner that was able to read all the tags in shelved library material successfully during inventory control.

A contributing factor was that during the tagging project as part of the first implementation, the tags were not placed in the books according to the recommended international standards. However, even when books containing tags which were placed in the standardised manner were used during testing, the scanners still could not detect all the tags, with the detection rate being 15 to 17 out of every 20 tags detected. This occurred even when the information on the tags was correct and there were no other errors with the tags. It should also be noted that this was still a problem when books were tested when not on the shelves. Tests conducted on books on the shelves delivered even worse results.

Thin books made detection of the tags during inventory control even more difficult as the tags are too close together owing to the thinness of the books. Metal shelves also cause problems especially with the first and last books on a shelf, as metal disrupts the radio signal between the tag scanner and the tags.

RFID inventory control was found not to be an advantage of implementing a RFID system.

4.12 RFID EQUIPMENT ONLY USED BY LIBRARY STAFF

There is certain RFID equipment that is only used by library staff but which forms a crucial part of the self-help circulation services to users. In this section, certain aspects of the equipment will be analysed. This equipment is the following:

- RFID staff workstation: There are two types of RFID staff workstation in use. The older version that was part of the 2010 RFID tender allows the issue and return of books by circulation librarians at the manual circulation desk and the delivery section. The newer version that was part of the second 2013 tender allows for the issue and return of books, and the desensitisation and sensitisation of EM security strips in the books. The newer version also allows information on the RFID tags to be added or edited by staff at the manual circulation desk.

- RFID staff conversion station: There are two types of conversion station in use. The older type was procured as part of the first RFID tender, while the newer one was procured as part of the second. Both types of conversion station are used solely for adding information to or editing information on the tags by the acquisitions tagging team and also by some of the Unisa libraries.

- RFID sorter machine: This machine was installed in the delivery section of the Muckleneuk Library. The sorter was procured as part of the first RFID tender and is used to sort books from the Muckleneuk self-return services and books returned at the manual circulation desk. The machine is also used to return and sort books that are received from library users via mail and courier.

4.12.1 RFID staff workstations

4.12.1.1 Functionality of the newer staff workstation used by library staff

Library staff respondents, including circulation librarians, delivery staff and shelving staff, were posed questions to ascertain which functionality of the newer RFID staff workstations they were using. The results were as follows:

Table 4.51 Newer staff workstation functionality used

Library section	Functionality used							
	Issuing		Returning		Sensitising		Desensitising	
	Yes	No	Yes	No	Yes	No	Yes	No
Circulation librarians (total 24)	24 (100%)	0	23 (95.83%)	1 (4.17%)	18 (75%)	6 (25%)	17 (70.83%)	7 (29.17%)
Delivery staff (total 3)	3 (100%)	0	3 (100%)	0	0	3 (100%)	0	3 (100%)
Shelving staff (total 10)	0	10 (100%)	0	10 (100%)	0	10 (100%)	0	10 (100%)

Table 4.51 (cont.) Newer staff workstation functionality used

Library section	Functionality used	
	Writing and editing information on the RFID tags	
	Yes	No
Circulation librarians (total 24)	6 (25%)	18 (75%)
Delivery staff (total 3)	0	3 (100%)
Shelving staff (total 10)	0	10 (100%)

The use of the different functions of the newer RFID staff workstations by circulation librarians were as follows:

All circulation librarians used issuing, while 23 (95.83%) used returning and only one respondent (4.17%) did not use returning. 18 (75%) used the staff workstations for sensitising, with six (25%) not using the sensitising function. Desensitising was used by 17 (70.83%) while seven (29.17%) did not. Six (25%) used the writing and editing of tag information function, with 18 (75%) not using this function.

It is clear that the greater majority of the circulation librarians used the issue and return functions. Although still in the majority, fewer respondents used the sensitising and desensitising functions. However, according to the systems librarians, when books are issued or returned using the staff workstations desensitising and sensitising of the books occur automatically. Therefore, it seems as if there is a lack of knowledge and a need for more adequate formal or in-service training in the use of the functions of the staff workstation and proper written procedures. The greater minority of staff indicated that they used the writing and editing functions. In some cases, staff indicated that books with tag information to be added or edited were sent to the acquisitions tagging staff as they felt that this is a function of the acquisitions section.

Delivery staff indicated in 100% of cases that the staff workstations were used for issuing and returning but none of them used it for the other functions. The same is relevant for this group as for the circulation librarians regarding sensitising and desensitising as well as the writing and editing functions.

All (100%) of shelving staff indicated that they did not use the newer RFID staff workstation for any of the functions mentioned in Table 4.51. From the comments section in the question posed it became clear that this was used solely for counting the books used in the Muckleneuk library.

4.12.1.2 Satisfaction with use of the RFID staff workstations

Library staff respondents, including circulation librarians, delivery staff, shelving staff and systems librarians, were posed a question to ascertain their satisfaction with using the new RFID staff workstations. A Likert scale was used to analyse the results, ranging from 1 (Not satisfied at all) to 5 (Very satisfied). The results are as follows:

Table 4.52 Satisfaction with using the RFID staff workstations

Library staff category	**Rating on Likert scale**					
	1	2	3	4	5	Total
Library circulation staff	1 (4.17%)	1 (4.17%)	12 (50%)	6 (25%)	4 (16.66%)	24 (100%)
Delivery staff	0	2 (66.67%)	0	0	1 (33.33%)	3 (100%)
Shelving staff	0	0	4 (40%)	6 (60%)	0	10 (100%)
Systems librarians	0	1 (50%)	1 (50%)	0	0	2 (100%)

Four (16.66%) of the circulation librarian respondents rated satisfaction as 5 on the scale and six (25%) as 4. A combined total of ten (41.66%) respondents rated satisfaction as 4 or 5 on the scale. One (4.17%) circulation librarian respondent rated satisfaction as 1 and one (4.17%) as 2 on the scale. A combined total of two (8.34%) respondents rated satisfaction as 1 or 2 on the scale, while 12 (50%) respondents were neutral, rating satisfaction as 3.

Apart from the neutral circulation librarian respondents (12, 50%), most respondents (ten, 41.66%) rated satisfaction as “Satisfied” (combination of 4 and 5), with only two (8.34%) rating satisfaction as “Not satisfied”. The high neutral rating is an indication of respondents not experiencing a definite feeling of satisfaction or non-satisfaction.

One (33.33%) delivery staff member rated satisfaction as 5 on the scale and none rated satisfaction as 4. Two (66.67%) of the respondents rated satisfaction as 2 on the scale while none rated it as 1. No respondents were neutral. The majority of delivery staff – two (66.67%) were therefore not very satisfied with the use of the RFID staff workstations.

The majority of the shelving staff – six (60%) rated satisfaction as satisfied or 4 on the scale, while four (40%) of the shelving staff were neutral regarding satisfaction.

The two systems librarians indicated a satisfaction rating of 3 (50%) and 2 (50%) respectively on the scale. One respondent is therefore neutral and one is not satisfied. The systems librarians rated their satisfaction with the RFID staff workstations based on their experiences while maintaining and supporting the equipment and assisting staff with the use of the staff workstations.

4.12.1.3 Ease of use of the RFID staff workstations

Circulation librarians, delivery staff and shelving staff respondents were also posed a question to ascertain the ease of use of the RFID staff workstations. A Likert scale was used to analyse the results, ranging from 1 (Not easy at all) to 5 (Very easy). The results are as follows in table 4.53:

Table 4.53 Ease of using the staff workstations

Library staff category	**Rating on Likert scale**					
	1	2	3	4	5	Total
Circulation librarians	0	1 (4.17%)	7 (29.16%)	10 (41.67%)	6 (25%)	24 (100%)
Delivery staff	0	1 (33.33%)	1 (33.33%)	0	1 (33.33%)	3 (100%)
Shelving staff	0	0	4 (40%)	4 (40%)	2 (20%)	10 (100%)

Six (25%) circulation librarian respondents rated ease of use as 5 on the scale and ten (41.67%) rated it as 4. A combined total of 16 (66.67%) respondents rated ease of use as 4 or 5 on the scale, while none rated it as 1 and one (4.17%) rated it as 2. A

combined total of one (4.17%) respondent rated ease of use as 1 or 2 on the scale, while seven (29.16%) respondents were neutral, rating ease of use as 3. Apart from the neutral respondents, most of the respondents (16, 66.67%) rated ease of use as easy (combination of 4 and 5). Only one (4.17%) rated ease of use as not easy.

One (33.33%) delivery staff member rated ease of use as 5 on the scale, one (33.33%) respondent rated ease of use as 2 and none rated ease of use as 1. In addition, just one (33.33%) respondent was neutral (3 on the scale) in this regard. Ease of use was therefore rated more as “Very easy” than “Not easy” with a rating of 5 versus 2 on the scale.

Ease of use was rated as 5 on the scale by two (20%) and as 4 by four (40%) shelving staff, with four (40%) shelving staff being neutral regarding ease of use. The majority of shelving staff – six (60%) rated ease of use as easy.

The Pearson correlation was calculated between the variables *ease of use* and *satisfaction with use* of the staff workstations for all library staff. The significance of the correlation was calculated and found to be at the 0.01 level between Table 4.53 above – *ease of use* and Table 4.52 – *satisfaction with use*.

4.12.1.4 Problems experienced with the RFID staff workstations

Circulation librarians, delivery staff, shelving staff and systems librarians were asked whether they experienced any problems while using the RFID staff workstations. The systems librarians’ experiences were based on their role in the support and maintenance of the RFID staff workstations and assisting staff with the use of the staff workstations. The results are as follows in Table 4.54:

Table 4.54 Problems with the RFID staff workstations

Library staff category	**Problems experienced**			
	Yes	**No**	**No answer**	**Total**
Circulation librarians	11 (45.83%)	8 (33.33%)	5 (20.84%)	24 (100%)
Delivery staff	1 (33.33%)	2 (66.67%)	0	3 (100%)
Shelving staff	8 (80%)	2 (20%)	0	10 (100%)
Systems librarians	2 (100%)	0	0	2 (100%)

11 (45.83%) circulation librarians indicated that they experienced problems with the RFID staff workstations, while eight (33.33%) indicated they did not experience problems; thus, the majority of circulation librarians experienced problems with the RFID staff workstations.

One (33.33%) delivery staff respondent indicated that problems were experienced with the RFID staff workstations, while two (66.67%) indicated they did not experience problems. Hence, the majority did not experience problems.

Eight (80%) shelving staff experienced problems with using the staff workstation, while just two (20%) indicated they did not experience any problems.

Two (100%) systems librarians indicated that problems were experienced with the RFID staff workstations.

Circulation staff indicated the following problems in the comments that accompanied their answers:

The RFID staff workstations do not always read the RFID tags in the library material items. This indicates a problem with the quality of the tagging process, and thus, the RFID staff workstations are unable to read it. This is apart from some occurrences of hardware or software issues that will also affect the ability of the equipment to read the tag information.

Delivery staff indicated the following problems in the comments that accompanied their answers:

Both hardware and software problems are experienced with the RFID staff workstations. The staff workstations will sometimes read the information on the tags but will not always display the information in the LMS successfully.

Shelving staff highlighted the following problems in the comments accompanying their answers:

Hardware and network problems were experienced. The staff workstation did not always read the tags of more than one book at a time successfully. According to the systems librarians the staff workstations should be able to do this. The staff workstation sometimes read the information on the tags but did not always display the information in the LMS successfully. Some shelving staff experienced the position of the staff workstation on the desk as not conducive to the daily counting of books used in the library.

The Pearson correlation was calculated between the variables *problems during use* and *satisfaction with use* of the staff workstations for all library staff. The significance of the correlation was calculated and found to be at the 0.01 level between Table 4.54 above – *problems during use* and Table 4.52 – *satisfaction with use*.

4.12.2 RFID staff conversion stations

RFID staff conversion stations are used for the sole purpose of writing and editing the tag information. Questions regarding conversion stations focusing on the satisfaction, ease of use and problems experienced were posed.

4.12.2.1 Satisfaction with use of the RFID staff conversion stations

Library staff respondents including circulation librarians, acquisitions tagging staff and systems librarians were posed a question to ascertain their satisfaction with using the RFID staff conversion stations. The total of circulation librarian respondents was less than the usual 24 as not all the Unisa libraries with RFID equipment had access to conversion stations. A Likert scale was used to analyse the results, which ranged from 1 (not satisfied at all) to 5 (very satisfied). The results are as follows:

Table 4.55 Satisfaction with using the RFID staff conversion stations

Library staff category	**Rating on Likert scale**						
	1	2	3	4	5	No answer	Total
Circulation librarians	1 (12.5%)	0	3 (37.5%)	2 (25%)	2 (25%)	0	8 (100%)
Acquisitions tagging staff	0	0	0	2 (50%)	2 (50%)	0	4 (100%)
Systems librarians	0	0	1 (50%)	0	0	1 (50%)	2 (100%)

Two (25%) circulation librarian respondents rated their satisfaction as 5 on the scale and two (25%) as 4. A combined total of four (50%) respondents rated satisfaction as 4 or 5 on the scale. One (12.5%) circulation librarian respondent rated satisfaction as 1 and none rated satisfaction as 2 on the scale. A combined total of one (12.5%) respondent rated satisfaction as 1 or 2, while three (37.5%) respondents were neutral and rated satisfaction as 3 on the scale.

Apart from the neutral respondents, the majority of respondents – four (50%) rated satisfaction as satisfied (combination of 4 and 5 ratings), with only one (12.5%) rating

satisfaction as not satisfied. The high neutral rating is an indication of respondents not experiencing a definite feeling of satisfaction or non-satisfaction.

Two (50%) acquisitions tagging staff members rated satisfaction on the scale as 5 and another two (50%) rated it as 4. A combined total of four (100%) rated satisfaction as 4 or 5 on the scale, while none rated it as 1, 2 or 3. Hence, a great majority of respondents (100%) rated the use of the conversion stations as satisfactory.

One (50%) systems librarians indicated a satisfaction rating of 3 on the scale, thus rating the satisfaction as neutral. One respondent (50%) did not answer the question as he/she was not involved in the maintenance and support of the conversion stations.

4.12.2.2 Ease of use of the RFID staff conversion stations

Library staff respondents, including circulation librarians and acquisition tagging staff, were posed a question to ascertain the ease of use of the RFID staff conversion stations. The total of circulation librarian respondents was less than the usual 24 as not all the Unisa libraries with RFID equipment had access to conversion stations. A Likert scale was used, ranging from 1 (not satisfied at all) to 5 (very satisfied). The results were as follows (see Table 4.56):

Table 4.56 Ease of using the RFID staff conversion stations

Library staff category	**Rating on Likert scale**					
	1	2	3	4	5	Total
Circulation librarians	2 (25%)	1 (12.5%)	1 (12.5%)	2 (25%)	2 (25%)	8 (100%)
Acquisitions tagging staff	0	0	0	1 (25%)	3 (75%)	4 (100%)

Two (25%) circulation librarian respondents rated ease of use as 5 and two (25%) rated it as 4 on the scale. A combined total of four (50%) respondents rated ease of use as 4 or 5 on the scale. Two (25%) circulation librarian respondents rated ease of use 1 on

the scale and one (12.5%) rated it as 2. A total of three (37.5%) respondents rated ease of use as 1 or 2 on the scale. One (12.5%) respondent was neutral and rated ease of use as 3 on the scale. However, the majority of respondents – four (50%), rated use as being easy (combination of 4 and 5 ratings), while three (37.5%) rated use as not easy.

Three (75%) acquisitions tagging staff rated ease of use as 5 on the scale and one (25%) as 4. A combined total of four (100%) rated ease of use as 4 or 5 on the scale, while none rate it as 1, 2 or 3. Hence, the great majority of respondents (100%) rated the use of the conversion stations as easy.

The Pearson correlation was calculated between the variables *ease of use* and *satisfaction with use* of the staff conversion stations for library staff. The significance of the correlation was calculated and found to be at the 0.01 level between Table 4.56 above – *ease of use* and Table 4.55 – *satisfaction with use*.

4.12.2.3 Problems experienced with the RFID staff conversion stations

Circulation librarians, acquisitions tagging staff and systems librarians were asked whether they experienced any problems while using the RFID staff conversion stations.

The results are as follows:

Table 4.57 Problems with the RFID staff conversion stations

Library staff category	**Problems experienced**			
	Yes	**No**	**No answer**	**Total**
Circulation librarians (24)	1 (12.5%)	6 (75%)	1 (12.5%)	8 (100%)
Acquisitions tagging staff	4 (100%)			4 (100%)
Systems librarians	1 (50%)		1 (50%)	2 (100%)

One (12.5%) circulation librarian indicated that problems were experienced with the RFID staff conversion stations, while six (75%) indicated that they did not experience problems and one (12.5%) did not answer the question. A minority of circulation librarians that had access to the RFID staff conversion stations experienced problems with the RFID staff conversion stations.

Four (100%) acquisitions tagging staff experienced problems with the RFID conversion stations.

One (50%) systems librarian indicated that problems were experienced with the RFID staff conversion stations, while the other one (50%) did not answer as he/she had not been involved in the support and maintenance of the RFID staff conversion stations.

No details regarding the problems experienced were supplied by the one circulation librarian that confirmed that problems were experienced.

Acquisitions tagging staff indicated in the comments that accompanied their answers that they experienced the following problems:

Hardware and software problems were experienced, with the staff conversion stations not always being able to add information to or edit the information on the tags. The barcode scanners also did not always scan the barcodes successfully into the staff conversion station software. Staff also had to be careful not to put the rest of the library material waiting to be tagged too close to the staff conversion stations, as the wrong information could easily be added to the tag by accidentally adding the tag information from the previous item.

The one systems librarian indicated that most of the problems were hardware and software problems. These problems prevented information from being successfully added or edited on the tags.

The Pearson correlation was calculated between the variables *problems experienced* and *satisfaction with use* of the staff conversion stations for library staff. The significance of the correlation was calculated and found to be at the 0.01 level between Table 4.57 above – *problems experienced* and Table 4.55 – *satisfaction with use*.

4.12.3 RFID sorter machine

4.12.3.1 RFID sorter machine and easier and faster sorting and shelving

Questions were posed to the shelving staff (ten respondents) regarding the use of the sorter machine and whether it enabled easier and faster sorting and shelving of books. The results are as follows (see Figure 4.10):

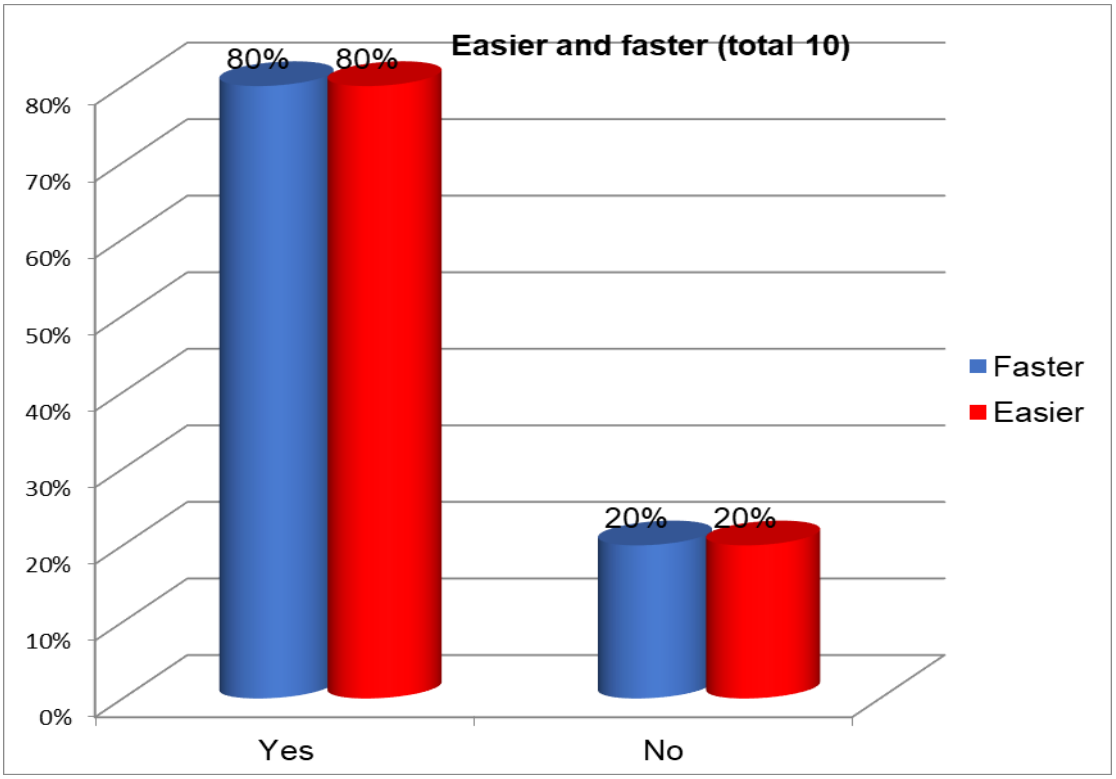

Figure 4.10 Easier and faster sorting and shelving using the RFID sorter

It is clear from the table that shelving staff experienced the use of the RFID sorter machine as making sorting and shelving of books faster and easier – eight (80%) respondents indicated that sorting and shelving are faster and easier.

Staff commented on how sorting and shelving were made faster and easier. Here is a summary of their comments:

Books are sorted into one of nine bins using the sorter machine and a combination of Dewey numbers and location codes. Thus, at the Muckleneuk library, books are sorted into specific bins for each level in the library where the books are shelved. There is also a bin specifically for books from other Unisa libraries and a separate bin for books that have been identified as being “On hold” for users. Books with incorrect information on

tags or no tags are also identified during sorting. Automatic sorting using the sorter is quick and easy and hence shelving is also speeded up. Use of the sorter also reduces human error as books are sorted into a specific bin for a specific level.

Staff also commented on why sorting and shelving were not made faster and easier. Here is a summary of comments:

Initial sorting is made faster and easier but further sorting within a level must still be done manually. Books that are allocated an incorrect Dewey number during cataloguing will be sorted into the wrong bin and therefore identified as belonging to the wrong level.

4.12.3.2 Satisfaction with use of the RFID sorter machine

Shelving staff and systems librarians were also posed a question to ascertain their satisfaction with using the RFID sorter machine. A Likert scale ranging from 1 (Not easy at all) to 5 (Very easy) was used to analyse the results. The results are as follows (see Table 4.58):

Table 4.58 Satisfaction with using the RFID sorter

Library staff category	**Rating on Likert scale**					
	1	2	3	4	5	Total
Library shelving staff	0	0	3 (30%)	5 (50%)	2 (20%)	10 (100%)
Systems librarians	0	0	0	1 (50%)	1 (50%)	2 (100%)

Two (20%) library shelving staff respondents rated satisfaction as 5 and five (50%) rated satisfaction as 4 on the scale. A combined total of seven (70%) respondents rated satisfaction as 4 or 5 on the scale and three (30%) respondents were neutral and rated satisfaction as 3. Hence, the majority of shelving staff (70%) rated their satisfaction on the satisfied part of the scale.

The two systems librarians indicated a satisfaction rating of 5 (50%) and 4 (50%) respectively on the scale, with one respondent therefore being “Very satisfied” and the other being “Satisfied”. The two (100%) respondents rated satisfaction with use as a combined total of 4 or 5 on the scale.

4.12.3.3 Ease of use of the RFID sorter machine

Shelving staff respondents were also posed a question to ascertain the ease of using the RFID sorter machine. A Likert scale ranging from 1 (Not easy at all) to 5 (Very easy) was used to analyse the results, which are displayed in Table 4.59:

Table 4.59 Ease of using the RFID sorter

Library staff category	**Rating on Likert scale**					
	1	2	3	4	5	Total
Library shelving staff	0	0	0	6 (60%)	4 (40%)	10 (100%)

Four (40%) library shelving staff respondents rated ease of use as 5 on the scale and six (60%) rated it as 4. All ten (100%) respondents rated ease of use as a combined total of 4 or 5. The majority of shelving staff (100%) rated ease of use on the easy part of the scale.

The Pearson correlation was calculated between the variables *ease of use* and *satisfaction with use* of the sorter machine for library staff. The significance of the correlation was calculated and found to be at the 0.01 level between Table 4.59 above – *ease of use* and Table 4.58 – *satisfaction with use*.

4.12.3.4 Problems experienced with the RFID sorter machine

Shelving staff and systems librarians were asked whether they had experienced any problems while using the RFID sorter machine. The results are displayed in Table 4.60:

Table 4.60 Problems with the RFID sorter

Library staff category	**RFID sorter problems**			
	Yes	**No**	**No answer**	**Total**
Shelving staff	4 (40%)	6 (60%)	0	10 (100%)
LTS systems librarians	2 (100%)		0	2 (100%)

Four (40%) shelving staff indicated that they experienced problems with the RFID sorter machine, while six (60%) indicated that they did not. Thus, the majority of shelving staff did not experience problems with the RFID sorter machine.

On the other hand, two (100%) systems librarians indicated that problems were experienced with the RFID sorter machine.

Shelving staff indicated the following problems in the comments accompanying their answers:

Sometimes the sorter machine malfunctions owing to hardware and software problems, while network-related problems also affect its efficient functioning. These respondents indicated that the sorter machine is not always able to sort the books as the information on the tags is incorrect or there are no tags in the items. In some cases, the books can be sorted but as a result of incorrect tag information they are sorted into the wrong bin.

The Pearson correlation was calculated between the variables *problems experienced* during use and *satisfaction with use* of the sorter machine for library staff. The significance of the correlation was calculated and found to be at the 0.01 level between Table 4.60 above – *problems experienced* and Table 4.58 - *satisfaction with use.*

4.12.4 Training of library staff in the use of the RFID staff equipment

Circulation librarians, delivery staff, acquisitions tagging staff, shelving staff and systems librarians were asked whether they had received training on the use of the RFID equipment meant for use by library staff only.

The Pearson correlation was calculated between the variables *training* and *satisfaction with use* of the RFID staff equipment for library staff use. The significance of the correlation was calculated and found to be at the 0.01 level between Table 4.61 to 4.67 – t*raining* and Table 4.52, 4.55 and 4.58 – *satisfaction with use*.

4.12.4.1 Training of circulation librarians in the use of the RFID staff workstations (24 respondents)

Table 4.61 Circulation librarians and RFID staff workstation training

Training in using RFID staff workstations (total 24)								
Received training on using the RFID staff workstations- Yes		**Did training enable you to use the RFID staff workstations?**			**Received training on using RFID staff workstations- No**		**Would training have enabled you to use the RFID staff workstations?**	
Yes	No answer	Yes	No	No answer	No	No answer	Yes	No
21 (87.5%)	0	17 (80.95%)	2 (9.52%)	2 (9.52%)	3 (12.5%)	0	2 (66.67%)	1 (33.33%)

21 (87.5%) of the respondents had received training and 17 (80.95%) of these felt that they were enabled by the training in the use of the RFID staff workstations while two (9.52%) felt that they had not been enabled by the training. Three (12.5%) of the respondents indicated they had not received training, two (66.67%) of whom indicated

that training would have enabled them to use the RFID staff workstations while the other one (33.33%) indicated training would not have enabled the use of the workstations.

Respondents that indicated that they were not enabled by the training received or that in the case of a lack of training, if training was received it would not have been enabling, commented on the reasons why it was not. The reasons are summarised as follows:

The RFID staff workstations malfunctioned too often. So, although training had been received, some staff perceived the training as not being enabling because of the problems experienced with the staff workstations. One staff member indicated that the workstations were not used as part of daily duties. So, the staff member was trained but after the training did not have to apply the knowledge gained. Another staff member indicated that in-service training by a colleague was received but that had not been enabling. In this case there is a hint that the in-service training was not adequate to enable the effective use of the workstation.

4.12.4.2 Training of delivery staff in the use of the RFID staff workstations (3 respondents)

Table 4.62 Delivery staff and RFID staff workstation training

Training in using RFID staff workstations (total 3)								
Received training on the RFID staff workstations – Yes		**Did training enable you to use the RFID staff workstations?**			**Received training on using the RFID staff workstations – No**		**Would training have enabled you to use the RFID staff workstations?**	
Yes	No answer	Yes	No	No answer	No	No answer	Yes	No
2 (66.67%)	0	1 (50%)	1 (50%)	0	1 (33.33%)	0	1 (100%)	0

Two (66.67%) of the respondents received training. One (50%) of the two respondents that received training felt enabled in the use of the RFID staff workstations by the

training but the other one (50%) did not feel this way. One (33.33%) of the respondents indicated that no training had been received. This respondent (100%) also indicated that if training had been received it would have enabled the use of the RFID staff workstations.

The one respondent that indicated that the training received was not enabling commented on why it was not as follows:

The use of the RFID staff workstations was not seen as a better alternative to the old way where user and item barcodes were scanned during circulation. In this case there is a hint of user resistance toward using the RFID staff workstation.

4.12.4.3 Training of shelving staff in the use of the RFID staff workstations (10 respondents)

Table 4.63 Shelving staff and RFID staff workstation training

Training in using RFID staff workstations (total 10)								
Received training on the RFID staff workstations – Yes		**Did training enable you to use the RFID staff workstations?**			**Received training on using the RFID staff workstations – No**		**Would training have enabled you to use the RFID staff workstations?**	
Yes	No answer	Yes	No	No answer	No	No answer	Yes	No
10 (100%)	0	10 (100%)	0	0	0	0	0	0

All ten (100%) shelving staff respondents had received training and all felt that training enabled them in the use of the RFID staff workstations.

4.12.4.4 Training of acquisitions tagging staff in the use of the RFID conversion stations (4 respondents)

Table 4.64 Acquisitions tagging staff and RFID conversion stations training

Training in using RFID staff conversion stations (total 4)								
Received training on using the RFID conversion stations – Yes		**Did training enable you to use the RFID conversion stations?**			**Received training on using the RFID staff conversion stations – No**	**Would training have enabled you to use the RFID conversions?**		
Yes	No answer	Yes	No	No answer	No	Yes	No	No answer
3 (75%)	0	3 (100%)	0	0	1 (25%)	0	0	0

The majority of respondents had received training – three (75%) and all three indicated that they were enabled by the training. One (25%) of the respondents, however, indicated he/she had not received training but gave no response as to whether training would have been enabling in using the RFID conversion station.

4.12.4.5 Training of circulation librarians in the use of the RFID conversion stations (24 respondents)

Table 4.65 Library circulation staff and RFID conversion station training

Training in using RFID staff conversion stations (total 24)							
Received training on using the RFID conversion stations – Yes	**Did training enable you to use the RFID conversion stations?**		**Received training on using the RFID conversion stations – No**	**Would training have enabled you to use the RFID conversions?**		**No conversion stations at the library**	**No answer (from total of 24)**
Yes	Yes	No	No	Yes	No		
3 (12.5%)	3 (100%	0	4 (16.67%)	2 (50%)	2 (50%)	15 (62.5%)	2 (8.33%)

The majority of respondents did not receive training – four (16.67%) while three (12.5%) had received training. Three (100%) indicated that they were enabled by the training. Two (50%) respondents who did not receive training indicated that training would have enabled them to use the conversion stations and another two (50%) indicated it would not have enabled them. It should be noted that 15 (62.5%) respondents indicated that the libraries where they were based did not have any RFID staff conversion stations.

4.12.4.6 Training of shelving staff in the use of the RFID sorter machine (10 respondents)

Table 4.66 Shelving staff and RFID sorter training

Training in using the RFID sorter machine (total 10)								
Received training on using the RFID sorter machine – Yes		**Did training enable you to use the RFID sorter machine?**			**Received training on using the RFID sorter machine– No**	**Would training have enabled you to use the RFID sorter machine?**		
Yes	No answer	Yes	No	No answer	No	Yes	No	No answer
10 (100%)	0	10 (100%)	0	0	0	0	0	0

All shelving staff received training – ten respondents (100%). All (100%) shelving staff confirmed that training enabled them in the use of the RFID sorter machine.

4.12.4.7 Training of systems librarians in the use of the RFID staff equipment (2 respondents)

Table 4.67 Systems librarians and RFID equipment training

Training in using RFID staff equipment (total 2)								
Received training on the maintenance and support of the RFID staff equipment – Yes		**Did training enable you to maintain and support the RFID staff equipment?**			**Received training on the maintenance and support of the RFID staff equipment – No**	**Would training have enabled you to maintain and support the RFID staff equipment?**		
Yes	No answer	Yes	No	No answer	No	Yes	No	No answer
2 (100%)	0	2 (100%)	0	0	0	0	0	0

All (100%) of the LTS respondents indicated that they had received training and that the training had enabled them to maintain and support the RFID equipment used by library staff.

4.13 CONCLUSION

Analysis of the collected data was done. Factors, best practice, advantages and disadvantages that influence the RFID self-help circulation services were identified and analysed using Unisa as case study. The different aspects relating to RFID equipment used by library staff were also analysed. The Pearson correlation between variables was calculated. In the following chapter, the research findings will be interpreted and discussed.

CHAPTER 5

INTERPRETATION AND DISCUSSION OF THE RESEARCH FINDINGS

5.1 INTRODUCTION

In the previous chapter the quantitative and qualitative data was analysed. Factors, best practice and the advantages and disadvantages that influence RFID self-help circulation services were identified and briefly discussed with Unisa as case study.

Chapter 5 focuses on a further discussion and interpretation of the data analysed in Chapter 4. The interpretation and discussion of the research findings are done keeping the following objectives in mind:

- Identify best practice for the implementation of the RFID self-help circulation services in academic libraries.
- Identify the factors that have an influence on the effectiveness of the RFID self-help circulation services in academic libraries.
- Identify the advantages and disadvantages of implementing the RFID self-help circulation services in academic libraries.
- Compile recommendations to be considered before a library decides to implement the RFID self-help circulation services.

5.2 INDICATORS OF FACTORS, BEST PRACTICE, ADVANTAGES AND DISADVANTAGES THAT INFLUENCE RFID SELF-HELP CIRCULATION SERVICES

In Chapter 4 certain indicators of the presence of factors, best practice and advantages and disadvantages that influenced the implementation and use of RFID self-help circulation services at Unisa Library Services were highlighted.

In Chapter 4, Figures 4.3 and 4.4 show that there was no significant change from the use of the manual loan desk circulation services to using RFID self-help circulation services at the Unisa campus libraries. As illustrated by Chapter 4, Figure 4.4 by

December 2015 only 52% of circulation activities were performed using the RFID self-help circulation services. In Chapter 3, Section 3.4.3, the three articles by Ayre (2012a:12), Kiezykowski (2009:9) and McDonald (2011:28-29) were used to calculate what the average proposed percentage of self-help circulation use should be between six months and three years after the implementation of the RFID self-help circulation services. It was found that after more than five years, self-help circulation at Unisa Library Services should have been at least 75% of all circulation activities. This indicates that certain factors, best practice and advantages and disadvantages were present that affected the use of the RFID self-help circulation services.

This is further illustrated by studying the use and non-use of the RFID self-help circulation services by the different categories of users, as indicated in Table 4.1 in Chapter 4. A majority of 54.32% of the student respondents indicated that they did not use the RFID self-issue services, while an even greater majority of 61.11% of the student respondents indicated they did not use the RFID self-return services. In the case of the staff user respondents a majority of 61.86% indicated they used the self-issue services and 58.76% indicated they used the self-return services. In addition, 63.89% of the staff who were also students indicated that they used the RFID self-issue services with 58.33% that used the self-return services. It is clear that fewer students and more staff and staff who were also Unisa students used the RFID self-help services. Certain factors, best practice and advantages and disadvantages were causing this phenomenon.

The frequency of use of the RFID self-help circulation services is also an indicator of the presence of factors, best practice and advantages and disadvantages influencing the use of the RFID self-help services. Table 4.2 in Chapter 4 gives an analysis of the frequency of use of the RFID self-issue services by those respondents that indicated that they used the self-issue services. From Table 4.2 the highest frequency for each user category is as follows:

The highest frequency of use of the RFID self-issue services by students – 43 (19.37%) was “Once a month”, 19 (31.67%) staff respondents indicated that they used the self-issue services “Once every quarter” and 16 (34.78%) respondents who were staff and also Unisa students indicated they used the self-issue services “Once every quarter”. Hence, it is clear from the analysis of the frequency of use that student respondents

used the RFID self-issue services more often than staff and staff who were also Unisa students.

Chapter 4, Table 4.3 shows an analysis of the frequency of use of the RFID self-return services by those respondents that indicated that they used the self-return services. According to Table 4.3, the highest number of students, namely 48 (25.4%), indicated they used the self-return services “Once a month”, while 19 (33.33%) staff and 12 (28.57%) staff who were also Unisa students indicated the highest frequency of use of the RFID self-return services as “Once every quarter”. Therefore, it is clear from the analysis of the frequency of use that student respondents used the self-return services more often than staff and staff who were also Unisa students. Certain factors, best practice and advantages and disadvantages were causing this phenomenon.

The satisfaction with use of the RFID self-help circulation services is also an indicator of possible factors, best practice and advantages and disadvantages influencing the use of the RFID self-help services. From Table 4.4, Chapter 4 it is clear that the students, staff and staff who were also Unisa students who rated satisfaction with the use of the RFID self-issue services as combined totals of 4 or 5 – satisfied (65.76%, 58.34%, 65.22%) respectively, outnumbered the respondents who rated satisfaction as a combined total of 1 or 2 – not satisfied (9.01%, 13.33%, 8.69%) respectively. Table 4.6 in Chapter 4 illustrates that the students, staff and staff who were also Unisa students who rated satisfaction with the use of the RFID self-return services as combined totals of 4 or 5 – satisfied (71.43%, 78.95%, 71.42%) respectively, also far outnumbered the respondents who rated satisfaction as a combined total of 1 or 2 – not satisfied (4.76%, 7.01%, 7.15%) respectively.

Satisfaction with the RFID self-issue services as experienced by library staff, specifically circulation librarians and systems librarians were analysed in Chapter 4, Table 4.5. Circulation librarians’ satisfaction was based on their experiences while assisting library users with using the RFID self-help circulation services. Systems librarians’ satisfaction was based on their experiences while maintaining the self-issue equipment and during integration of the RFID self-issue services with the LMS.

66.67% of circulation librarians rated satisfaction on a combined total of 4 or 5, while 50% of systems librarians rated satisfaction on a combined total of 4 or 5. No circulation librarians or systems librarians rated satisfaction on a combined total of 1 or 2. Thus,

the majority of circulation librarians were satisfied. The 50% of systems librarians who were satisfied were not the majority of the systems librarian respondents; indeed 50% of the systems librarians rated satisfaction on 3 which means they were undecided. More importantly, no systems librarians rated satisfaction as a combined total of 1 or 2, meaning that the majority still rated satisfaction as 4 or 5 – satisfied instead of 1 or 2.

The satisfaction with the RFID self-return services as experienced by library staff, specifically circulation librarians and systems librarians was as follows (see Chapter 4, Table 4.7):

50% of circulation librarians rated satisfaction as a combined total of 4 or 5, 50% of systems librarians rated it as a combined total of 4 or 5, while 16.67% of circulation librarians and none of the systems librarians rated it as a combined total of 1 or 2. On the other hand, 50% of systems librarians rated satisfaction as 3 which mean that 50% was undecided. More importantly, no systems librarians rated satisfaction as a combined total of 1 or 2, in other words the majority still rated satisfaction as 4 or 5. Certain factors, best practice and advantages and disadvantages are causing this phenomenon with regards to satisfaction with RFID self-help circulation services.

The ease of use of the RFID self-help circulation services is also an indicator of the presence of possible factors, best practice and advantages and disadvantages influencing the use of the RFID self-help services. From Table 4.8, it is clear that the students, staff and staff who were also Unisa students who rated ease of use of the RFID self-issue services as combined totals of 4 or 5 – easy (68.95%, 60%, 69.56%) respectively, far outnumbered the respondents who rated satisfaction as combined totals of 1 or 2 – not easy (8.22%, 8.33%, 4.34%) respectively. Table 4.10 indicates that the students, staff and staff who were also Unisa students who rated ease of use of the RFID self-return services as combined totals of 4 or 5 – easy (78.84%, 87.72%, 78.57%) respectively, far outnumbered the respondents who rated ease of use as combined totals of 1 or 2 – not easy (4.24%, 7.02%, 7.14%) respectively.

The ease of use of RFID self-issue services as experienced by library staff, specifically circulation librarians were as follows (see Chapter 4, Table 4.9):

79.16% of circulation librarians rated ease of use as a combined total of 4 or 5 and 4.17% of them rated it as a combined total of 1 or 2. Clearly the majority of circulation librarians rated ease of use as a combined total of 4 or 5 – easy.

The ease of use of RFID self-return services as experienced by library staff, specifically circulation librarians, was as follows (see Chapter, Table 4.11):

79.16% of circulation librarians rated ease of use as a combined total of 4 or 5 and 4.17% rated it as a combined total of 1 or 2. Clearly, the majority of circulation librarians rated ease of use as 4 or 5 – easy. Certain factors, best practice and advantages and disadvantages are causing this phenomenon regarding ease of use of RFID self-help circulation services.

In Chapter 4 Section 4.8, management indicated which objectives were achieved by implementing RFID self-help circulation services. Senior management was not in agreement on whether the objective of making library circulation staff more available for assisting library users with more specialised services had been met. Moreover, an important objective that had not been achieved with the use of RFID technology was enabling inventory control staff to perform such control more easily and effectively. As with the previously mentioned indicators this means that certain factors, best practice and advantages and disadvantages had to be present that were causing the objectives to either be achieved or not achieved.

5.3 BEST PRACTICE THAT INFLUENCES THE USE OF THE RFID SELF-HELP CIRCULATION SERVICES

The best practice that influenced the RFID self-help circulation services are further discussed and interpreted in the following sections.

5.3.1 Feasibility study

Section 4.9.1 in Chapter 4 notes that management conducted a feasibility study by visiting libraries internationally, obtaining information during conferences and by comparing various RFID self-help circulation systems. The information gathered in this way was used to do benchmarking and to assist in decision-making regarding which RFID components would best suit Unisa Library Services. This is in accordance with

recommendations by Driscoll (2005:91); Norwood and Skinner (2012:164) and Singh and Midha (2008:445), as highlighted in the literature study, Chapter 2, Section 2.2.

However, even though a feasibility study was conducted, it should be noted that Unisa Library Services still did not succeed in implementing an RFID-based inventory control system successfully. This indicates that the way the feasibility study was conducted did not ensure that all options regarding RFID systems were exhaustively examined. Moreover, it was only during implementation that it was discovered that books could not be renewed using the RFID self-issue services nor could library users use the services to access their library user account information.

However, bearing in mind that Unisa is an ODeL institution, these two issues may not have a significant effect on service delivery to Unisa library users as a whole, because many users, specifically students, access and use the online library services from home or work and thus seldom visit a campus. For residential libraries, these two issues would have a more significant influence as most users, specifically students, visit the campuses in person. Other examples that indicate that the feasibility study was not entirely effective are mentioned and discussed in Section 5.3.6 and 5.3.7.

It is therefore important for libraries to ensure that a comprehensive feasibility study is performed before the decision on whether to use a RFID self-help circulation services system is taken.

5.3.2 Project management

During the literature study conducted in Chapter 2, Section 2.2, project management was highlighted as very important to ensure successful implementation (Kieczykowski 2009:10; McDonald 2011:26–28; Sukhula, Chaudhary & Neeraj 2011:28). Project management of the implementation of the RFID self-help circulation services at Unisa Library Services was the responsibility of the two companies that were awarded the separate tenders. Unisa Library Services' Director: Library Corporate Services also played a monitoring role as part of the project management process. Timelines were established to ensure as little disruption as possible during the project process. In addition, regular project meetings were held to ensure that the project was on track. All stakeholders crucial to the project were involved in the project, including staff members from the LMS company, the RFID companies, Unisa ICT, Unisa University Estates and

the relevant sections of Unisa Library Services. University Estates was responsible for structural changes to buildings which also included the supply of power outlets. Unisa's legal and procurement departments were also involved before and during the tender processes.

During implementation of RFID self-help circulation services it is crucial that the project be monitored by the relevant Library Services' senior management with support from the relevant library sections. Hence, it is important that senior management is familiar with the principles of project management. Project management starts prior to the tender process with the compiling of extensive specifications that will ensure the successful and efficient implementation of the relevant services. When compiling these technical and functional specifications, the above-mentioned institutional stakeholders must also be included. Specific timelines have to be established and regular meetings held with the relevant stakeholders to ensure that the project is completed in the agreed time. All stakeholders' responsibilities should be clearly outlined to prevent any aspects of the project being neglected. Additional, the involvement of the institution's legal and procurement departments ensure that legal and procurement requirements are adhered to during the tender process and also during project implementation.

5.3.3 Change management

As pointed out in the literature study in Chapter 2, Section 2.2, change management has to be included both during and after the implementation project (Bansode & Desale 2009:4; Kieczykowski 2009:10–11; Walczyk & Mohamed 2009:5). While Unisa Library Services management ensured that the general principles of change management were applied, they revealed that it had not been fully-fledged structured change management. Change management took the form of meetings with library staff to sensitise them to the new RFID technology and the reasons for implementing it. Change management was also used to communicate possible changes to staff roles. Formal training also formed part of change management during project implementation to ensure that the library staff was prepared to use the RFID technology. In-service training of new library staff was also done. From management's comments regarding change management it is clear that the focus was more on library staff and not the library users.

An analysis of the library staff's experience of change management displayed in Table 4.12 in Chapter 4, shows that the majority (56.52%) of library staff indicated that they had experienced some form of change management. The only two groups of library staff where the majority indicated that they had not experienced any form of change management were the circulation librarians and the systems librarians. According to the analysis, 45.83% of the circulation librarians indicated they had not experienced any form of change management, with 33.33% indicating they had. It is significant that most of the circulation staff did not experience any form of change management as they are the ones responsible for assisting library users with the RFID self-help circulation services. All (100%) of the systems librarians indicated that they had not experienced any form of change management. This means that a very important staff component, responsible for the maintenance and support of the RFID self-help circulation services and the successful integration of the LMS and the self-help circulation services systems, did not experience any form of change management. It should also be noted that although the majority of library staff indicated that they had experienced change management, there was a significant percentage that indicated that they had not. Change management should include all relevant library staff as far as possible.

The results of the data analysis displayed in Chapter 4, Table 4.13 show that 65.65% of the library user respondents indicated they did not experience any form of change management with regard to the use of the RFID self-issue services. Analysis of the results displayed in Chapter 4, Table 4.14 with regard to the RFID self-return services show that 66.41% of the library users indicated that they had not experienced any form of change management. What is significant is that the majority of all three groups of library users – students, staff and staff who were also Unisa students indicated that they had not experienced any form of change management. Hence, even Unisa staff who were library users indicated they did not notice any form of change management.

Libraries implementing RFID self-help circulation services need to make change management an integral part of the project management and post-project management phase. In Unisa Library Services' case, change management did not include all possible library users visiting Unisa campuses. Posters in the libraries and on campus and information on the Unisa Library Services' and even the university's websites regarding the RFID self-help circulation services would have been an effective way to ensure that

library users were aware of the services. It is also crucial that all library staff who will be using the RFID staff equipment and assisting users need to be reached by change management through meetings, e-mails and so forth. Training is also a crucial part of change management for both library staff and users.

5.3.4 Changes to buildings to cater for the RFID self-help circulation services equipment

In the literature study conducted in Chapter 2, Section 2.2 it was found that changes to buildings to cater for the RFID equipment need to be taken into account (Kieczykowski 2009:10; Singh, Brar & Fong 2006:26). Chapter 4, Section 4.9.4 highlighted certain changes that had to be made to Unisa library buildings. For example, changes had to be made to the building housing the RFID self-return machine. Enough space must be allowed to accommodate both the self-return machine and the accompanying return bin into which the books are deposited. This entailed providing a separate room or at least an enclosure that ensures that only authorised library circulation staff and maintenance technicians have access to the back-end of the machine and the bin. In Unisa Library Services' case at most libraries a separate enclosure had to be built so that only the self-return user interface and the book receiving slot would be accessible to library users.

Furthermore, there has to be sufficient space for the RFID sorter machine. The Unisa sorter machine is a bulky piece of equipment with a conveyor belt and nine bins for the books to be sorted into. The room where the sorter will be located must have enough space for shelving staff to move trolleys and sorter bins around. Additional bins to replace the full bins make the sorting process faster and easier; hence these additional bins also have to be taken into consideration when making provision for sufficient space. If there is not sufficient space available, changes to the building structure may be necessary, for example the removal of existing walls.

It is crucial to include additional power outlets and network points for all the RFID self-help circulation machines during the planning phase. The use of extension cords and multi-plugs should be limited as far as possible to protect the machines against damage and to prevent possible injury to library staff and users.

Any changes to the buildings must also consider the possible historical value of buildings. If this is a factor, then structural changes might not be allowed.

It is clear from the above that it is very important to address these changes to buildings during the planning phase of the RFID self-help services implementation, thus ensuring a practical and efficient service for library users.

5.3.5 Placement of RFID self-help services to enable circulation staff to monitor use

Section 4.9.5 in Chapter 4 discussed the way circulation librarians experienced the ease of monitoring the RFID self-help circulation services depending on where the self-help services were placed. All circulation librarian respondents indicated that the RFID self-issue machines were placed where use can be easily monitored. However, close to 60% indicated that the placement of the self-return machines was not conducive for easy monitoring. It is very important that self-help machines are placed in such a way that circulation librarians are able to monitor the use of the machines easily and to assist users where necessary.

Self-return machines were generally placed at the library entrance where monitoring by circulation librarians is not always possible. This was done so that users can even return books after library hours. The self-return machines were also placed elsewhere on the campuses, with the idea of making the self-return service even more accessible to users, but this was found to be impractical because use could not to be monitored and nor could users be assisted. Another problem in this regard was the difficulty experienced in getting the books from the self-return machines to the library in cases where the machines were placed away at a distance on the campus. Libraries need to keep this in mind when planning the placement of the machines.

5.3.6 Standards and protocols with which the RFID self-help circulation system must comply

In Chapter 2, Section 2.2 the importance of standards to ensure an efficiently functioning RFID self-help circulation service was emphasised by Ayre (2012c:20–26), Howard and Anderson (2005:34), Norwood and Skinner (2012:163) and Singh and Midha (2008:446). Chapter 4, Section 4.9.6 highlights the standards and protocols that

are crucial for delivering an efficient RFID self-help circulation service to library users. Standards pertaining to RFID self-help circulation systems are important to ensure that different RFID vendors' systems and RFID tags will be compatible (Ayre 2012c:21–26; Singh & Midha 2008:446). The Unisa Library Services are using RFID self-help circulation services from two different vendors. Hence, it is important that the different RFID tags and the different RFID self-help circulation systems comply with relevant standards to ensure that both systems can read each other's RFID tags. The standard that is most important is the standard that regulates the radio frequency to be used by the system. The standard radio frequency is 13.56MHz and the two systems and two types of tag in use at Unisa Library Services were found to be compatible with this standard.

Section 5.3.7 discussed the importance of protocols when choosing an RFID self-help circulation services system that is to be used with the existing LMS. The SIP2 protocol ensures that self-issuing and self-return data are correctly sent between the RFID self-help circulation system and the LMS. The limitations mentioned in Section 5.3.7 regarding the renewal of books and access by library users to their library account information and fines were all due to the fact that the SIP2 protocols of the LMS and the RFID self-help circulation services system differ. The RFID sorter machine in use does not comply with all aspects of the SIP2 protocol. Therefore, the sorter machine can only identify the "On hold" item status and none of the other item statuses in use on the LMS when sorting books.

It is thus clear how important it is to ensure, as early as the planning phase, that the RFID self-help circulation services system complies with the relevant standards. Apart from these standards, it is also very important to ensure that the RFID self-help circulation system and the LMS share the same SIP2 protocol. If they do not, it will influence the functionality of both the RFID self-help circulation system and the LMS.

5.3.7 Integration of the Library Management System and the RFID self-help circulation system

In Chapter 2, Section 2.2, the literature study, it was found that the integration of the LMS and RFID self-help circulation services systems is crucial to ensure that all circulation functionalities are available to library users (Ayre 2012a:15; Pandian

2010:139–140). The SIP2 protocol is important for ensuring that all circulation functionalities are possible when using the RFID self-help circulation services. This protocol forms part of both the LMS and the RFID self-help circulation services system. If certain functionality is not present in the SIP2 of either the LMS or the RFID self-help circulation services systems, that functionality will not be available during the self-help circulation process. The inability to use the RFID self-help circulation services to renew books and to access library user account information and fines results from the fact that the SIP2 protocol for the LMS and the RFID self-help circulation services system differ. In Chapter 4, Section 4.9.7 it was mentioned that certain circulation functionalities were not available due to integration issues.

During the research, it was also found that when more than one book was issued by stacking the books on the RFID self-issue machine, not all books were necessarily checked out although the security strips were desensitised. This led to books being issued without any record to this effect being created on the library user's library record. This also necessitated that circulation staff had to put up instructions that only one book at a time could be placed on the self-issue machine during the self-issue process. However, this did not necessarily prevent library users from trying to issue more than one book at a time by stacking the books. This might have led to some books not being issued on the library user's patron record on the LMS, which could result in the loss of library books.

It was also found during the research that when books were returned using the self-return services that in some cases not all books were reflected as returned on the user's library patron record. This led to incorrect fines being incurred. Circulation librarians were then also expected to handle the enquiries regarding these fines, which resulted in more work for the staff and also caused many users to experience the library self-help circulation services negatively.

Shelving staff and systems librarians also reported that, using the RFID sorter, only the "On hold" status could be identified during the automatic sorting process. Books with other statuses were then sorted into the bin for problem books. This led to staff still having to identify books with other statuses manually, for example books with a "Missing" status.

Inventory control using RFID equipment was found not to be possible as no scanner could be found that could read the RFID tags in the library material. Bearing in mind that inventory control was one of the key objectives for implementing RFID technology by Unisa Library Services, the fact that it was not possible meant that inventory control staff still have to use the old method of inventory control by scanning each book individually with a barcode scanner.

From the above it is clear that it is extremely important to ensure that the integration of the LMS and the functions of the RFID system are possible. In view of the high costs involved in obtaining, implementing and maintaining a RFID self-help circulation service, it is crucial to ensure that the SIP2 protocols of the LMS and the RFID self-help circulation system are the same. If integration is not assured, it will lead to an incomplete RFID self-help circulation service.

5.3.8 Ensuring library users are encouraged to use the RFID self-help circulation services

Chapter 4, Section 4.9.8 highlights the different methods that were employed by circulation librarians to ensure that library users use the RFID self-help circulation services instead of the manual circulation desk services. The advantages of the RFID self-help circulation services were explained to users, emphasising the convenience regarding the shorter queues resulting from the speed of the RFID self-help circulation services (Bansode & Desale 2009:5). Circulation staff also trained users to ensure that they were familiar with the services. This training took place during the library orientation programme, when users visited the campus libraries. Circulation staff also showed library users who visited the library circulation desk how to use the machines.

However, it should be noted that some of the circulation librarian respondents indicated that they did not actively encourage library users to use the self-help services instead of the manual services if users were reluctant. This therefore led to users using the manual circulation desk services instead, which explains the low usage of the self-help services in comparison to manual services, as indicated in Figures 4.3 and 4.4 in Chapter 4. Of great concern is the fact that some circulation librarian respondents indicated that in many cases Unisa staff and even library staff were unwilling to use the self-help circulation services. Lastly, it was found that assisting users in using the RFID

self-return services was difficult as these machines were generally placed at a distance from and out of sight of the manual circulation desk. This may also have led to circulation librarians feeling reluctant to refer library users to the self-return services.

It is very important that management, stipulating the reason and purpose of the RFID self-help circulation services, give a clear directive in order to encourage library users to use the self-help services. This will give circulation staff a mandate to actively encourage users to use these services. Circulation librarians should not feel that they have to allow users who are reluctant to use the self-help services to use the manual circulation desk. Accordingly, this directive should be made visible to users by placing it on the self-service machines and at the manual circulation desk services.

5.4 FACTORS HAVING AN INFLUENCE ON THE RFID SELF-HELP CIRCULATION SERVICES

The following factors that were found to have an influence on the RFID self-help circulation services are discussed and interpreted in the next section.

5.4.1 The tagging sub-project

5.4.1.1 Decision-making during the tagging sub-project

Tagging of the library material had to be done before any items could be circulated using the RFID self-help circulation services. An efficient tagging process is crucial to ensure that books can be circulated effectively using these services (Kieczykowski 2009:10; McDonald 2011:26-28; Sukhula, Chaudhary & Neeraj 2011:28). Unisa Library Services included the tagging of library material as a sub-project of the RFID implementation project. This ensured that tagging was included in the project timelines and planning, making it an integral part of the RFID project. The tagging of library material was outsourced to the company that had been awarded the first RFID tender as part of the tender specifications. This company used temporary workers for this purpose who were sourced from currently registered Unisa students by the project manager. The student workers were organised into teams with a team leader who led the tagging process. Because non-library workers were used for the tagging library material, quality control of the process was crucial. The quality control for this sub-project was the responsibility of the cataloguing section.

Placing tags in all the library material and writing the relevant information to the tags is a huge and time-consuming task. Libraries therefore need to decide whether they have

the number of staff needed to do the tagging. When making this decision, the size of the stock is a very important factor. Other options are to outsource tagging to either a company and/or to obtain temporary workers, for example students, to do the tagging under the supervision of library staff. Whichever option is chosen it is important to ensure that the tagging of library material is completed on time so that the rest of the RFID project does not fall behind.

There are further decisions that need to be made regarding the tagging of library material items. The format of the items to be tagged also necessitates certain decisions. During the literature study, Chapter 2, Section 2.4.2 indications were found that CDs and DVDs need special tags that are more expensive than and not as effective as the tags for books. However, Unisa Library Services use the same tags for books and CDs and DVDs. It must be remembered that in order to prevent damage to the material audio-visual items are not circulated via the self-help circulation services. Hence audio-visual material were tagged solely for inventory purposes.

A decision needs to be made regarding the type of information to be included on the tags. Unisa Library Services included the item barcode number, the country ID, Unisa Library Services ILL code, the relevant material type for example book, media package, DVD or CD and whether circulation is allowed. In Unisa Library Services' case the latter option was specifically chosen for bound periodicals and reference works that are not allowed to be issued. The title, author and other bibliographic information were not included on the tag as, when using the tag during self-issue and return, the above information was sufficient to identify an item on the LMS.

A decision also needs to be made regarding the placement of the tags in the library material items. This is crucial as incorrect placement of tags will lead to problems with reading the tags during self-issue and return and during the inventory control process. Tags must be placed in accordance with an international standard: they should be placed on the inside back page of the book. If the back page has any important information that should not to be covered, the tag should be placed on the next empty page from the back. Tags should be placed on the relevant page in a staggered way. In other words, the first tag should be placed 5 mm from the top of the page and at a distance of 2 to 3 mm from the spine of the first book being tagged. The tag of the second book should be placed lower down on the page than in the first book and still at

a distance of 2 to 3 mm from the spine. The same procedure will be followed in the subsequent books. With CDs and DVDs the tags are placed on the last page of the jacket or booklet in the CD or DVD case. Where important information will be covered by the tag, a separate piece of paper is glued into the case with the tag attached.

Another decision to be made concerns the use of more than one barcode format in a library service. Unisa Library Services currently has both the Unisa Library Services' ten-digit numeric barcodes and the seven-digit Technikon South Africa (TSA) Library Services' alfa-numeric barcodes on the items. The reason for this is that the two library services previously functioned as separate institutions before their merger. The ten-digit numeric barcodes were the format that was chosen after the merger as the future standard. Decisions libraries need to make in this regard include how the tagging of items will be approached in the case of one or more barcode formats. An example from the Unisa Library Services is where the TSA item barcodes could only be scanned onto the tags after three additional zeros had been entered. Libraries must decide on whether to re-barcode the items with the non-compatible barcodes before the tagging process commences or to cater for this during the tagging process. In Unisa Library Services' case only three zeros had to be entered which is not that time-consuming although time would still have been saved during the tagging process if all the library material had the same barcode format.

5.4.1.2 Quality of tagging

In Section 4.10.2 of Chapter 4, the results of the responses from shelving staff, delivery staff and circulation librarians regarding the quality of the tagging process were tabulated. The results were analysed according to the number of books that were found without RFID tags and items that were found where the information on the tags could not be read by the RFID equipment. From the analysis of the results there would appear to still be many occurrences of problems with tags even five years after RFID self-help circulation services implementation.

5.4.1.2.1 Number of books without RFID tags that could not be self-issued or self-returned or processed using the RFID staff equipment

Analysis of the data in Chapter 4, Table 4.15 shows that all shelving staff found more than 100 books without tags that could not be sorted using the sorter machine or while

using the RFID staff workstation for counting books used in the libraries since implementation.

Table 4.21 shows that circulation librarians indicated the number of books found without tags since implementation was as follows: 16.67% (more than 100 books), 4.17% (91–100 books), 4.17% (81–90 books), 12.5% (41–50 books), 8.33% (10–20 books), 25% (less than 10) and 8.33% (no books).

Analysis of the data in Table 4.27, Chapter 4 illustrates that the percentage of delivery staff who found books without tags while circulating books using the staff workstations were as follows: 66.67% (61–70 books) and 33.33% (21–30 books).

The results for books found per month by shelving staff, circulation librarians and delivery staff without RFID tags between January and December 2015 were as follows:

Shelving staff (see Table 4.18, Chapter 4): 70% (41–50 books) and 30% (21–30 books).

Delivery staff (see Table 4.30, Chapter 4): 66.67% (21–30 books) and 33.33% (less than 10 books).

Circulation librarians (see Table 4.24, Chapter 4): 4.17% (91–100 books), 4.17% (41–50 books), 8.33% (21–30 books), 12.5% (10–20 books), 37.5% (less than 10 books) and 12.5% (no books).

5.4.1.2.2 Number of books where the self-help machines and RFID staff equipment could not read the information on the RFID tags

Table 4.16, Chapter 4 illustrates that since implementation, 80% of shelving staff indicated that they found more than 100 books with tags of which the information on the tags could not be read during sorting using the sorter machine or by the RFID staff workstation, 10% of the respondents indicated they found 61 to 70 books and 10% found 51 to 60 books of which the information on the tags could not be read.

Table 4.22, Chapter 4 shows that since implementation of the RFID self-help circulation services circulation librarians found the following number of items with tags of which the information was unreadable by the self-help machines or the staff workstations: 16.67% (more than 100 books), 4.17% (91–100 books), 4.17% (81–90 books), 4.17% (41–50 books), 8.33% (10–20 books), 37.5% (less than 10 books) and 4.17% (no books).

After analysis of the data in Table 4.28, Chapter 4 it is clear that the percentage of delivery staff who found books with tags that were unreadable using the staff workstations are as follows: 33.33% (71–80 books) and 66.67% (51–60 books).

The results for items found per month by shelving staff, circulation librarians and delivery staff with RFID tags of which the information on the tags could not be read were as follows (January to December 2015):

Shelving staff (see Table 4.19, Chapter 4): 30% (more than 100 books), 30% (71–80 books) and 40% (51–60 books).

Circulation librarians (see Table 4.25, Chapter 4): 4.17% (more than 100 books), 4.17% (51–60 books), 4.17% (41–50 books), 4.17% (31–40 books), 12.5% (21–30 books), 4.17% (10–20 books), 37.5% (less than 10 books) and 8.33% (no books).

Delivery staff (see Table 4.31, Chapter 4): 33.33% (10–20 books) and 66.67% (less than 10 books).

Hence, it is clear from the above that prior to January 2015 a high number of books were found by shelving staff, circulation librarians and delivery staff to be without tags or with tags where the information on the tags could not be read by the RFID equipment. What is more important is that this trend had not changed significantly by the end of December 2015 when there were still a high number of books found per month. This is a clear indication that the quality of the tagging process was not up to standard, meaning that these books had to be sent back to the acquisitions section to have the information edited. This resulted in more work for the acquisitions staff and also led to items being unavailable to library users during the tagging process. It should be noted that since 2013 when the RFID self-help circulation services from the second tender were implemented, Unisa libraries where RFID self-help circulation services were available were supplied with RFID staff workstations that could also write and edit tags. Hence, staff were able to use these workstations to edit faulty information on tags of books found during the circulation process. The same is true for the shelving staff and the delivery staff as these two sections also received RFID staff workstations with write and edit functionality. However, according to Table 4.51, Chapter 4 all shelving staff and delivery staff and 75% of the circulation staff were not using the RFID staff workstations

for editing the information on the tags as it was still being seen as a function of the acquisitions section.

To summarise: it is very important for libraries that implement RFID self-help circulation services to plan the tagging process well. Quality control of the tagging process is crucial to prevent any staff time being wasted and a disruption in service to library users owing to items not having tags or problems with the tag information and therefore being unavailable. The decision whether temporary workers or library staff should be used for the initial tagging is also important to ensure that tagging is of a high quality. A decision also needs to be made regarding the availability of RFID staff workstations to library staff working with the books on a daily basis. As part of this decision, it has to be decided as to whether staff with access to RFID staff workstations will be expected to edit information on tags that are found to be unreadable or tag books with no tags.

5.4.1.3 Securing library items by using RFID tags

In Chapter 4, Tables 4.17, 4.20, 4.23, 4.26, 4.29 and 4.32 the results of the responses of the shelving staff, delivery staff and circulation librarians regarding the securing of items using RFID tags were tabulated. The results were analysed according to the number of books that were found with tags either removed or damaged. From the analysis of the results it is clear that there were still many occurrences of problems with tags being removed or damaged even five years after RFID self-help circulation services implementation.

5.4.1.3.1 Number of books found where the RFID self-help machines and RFID staff equipment could not process the items as the tags were removed or damaged

Table 4.17, Chapter 4 illustrates that since implementation 40% of shelving staff indicated that they found 31 to 40 books with tags removed or damaged during sorting or using the RFID staff workstation, 30% indicated they found 10 to 20 books and 30% found fewer than 10 books with tags removed or damaged.

The data from Table 4.23, Chapter 4 indicates that, since implementation, circulation librarians indicated the number of books found with tags removed or damaged that could not be read by the self-help machines or the RFID staff workstations was as

follows: 8.33% (more than 100 books), 4.17% (91–100 books), 4.17% (51–60 books), 8.33% (41–50 books), 4.17% (21–30 books), 20.83% (less than 10) and 29.17% (no books).

Analysis of the data from Table 4.29, Chapter 4 illustrates that the percentage of delivery staff who found books with tags removed or damaged while circulating books using the RFID staff workstations are as follows: 66.67% (41–50 books) and 33.33% (21–30 books).

The results for items found per month by shelving staff, circulation librarians and delivery staff with RFID tags removed or damaged are as follows (January to December 2015):

Shelving staff (see Table 4.20): 50% (21–30 books) and 50% (less than 10 books).

Circulation librarians (see Table 4.26, Chapter 4): 4.17% (21–30 books), 33.33% (less than 10 books) and 41.67 (no books).

Delivery staff (see Table 4.32, Chapter 4): 66.66% (less than 10 books) and 33.33% (no books).

It is therefore clear that before January 2015 there were a high number of books found by shelving staff and circulation librarians with tags removed or damaged. What is more important is that this trend had not changed significantly by the end of December 2015 when a high number of books were still being found every month. This meant that these items had to be sent back to the acquisitions section to have them tagged and the information added, resulting in more work for the acquisitions staff and books being unavailable to library users. It should be noted that since 2013 when the RFID self-help circulation services from the second tender were implemented, the RFID staff workstations supplied to the Unisa libraries where RFID self-help circulation services are available have also been able to write and edit tags. Hence, circulation staff could use these RFID staff workstations to tag and write information to the tags in books without tags or with damaged tags found during the circulation process. The same is true for the shelving staff as the shelving section also received a RFID staff workstation with write and edit functionality. However, according to Table 4.51, all shelving staff and delivery staff and 75% of circulation librarians were not using the RFID staff

workstations for editing and writing information on the tags as it was still being seen as a function of the acquisitions section.

Another issue that became clear from these statistics and comments from library staff respondents is that some library users seemed to think that the RFID tags in the library books were also used for securing the items against theft. As the tags are quite big and cannot be concealed, it is easy to find them especially as the tags are placed in a specific position in the books. Therefore, Unisa Library Services decided to not use the RFID tags for security purposes. This decision was confirmed during visits by Unisa Library Services management to international universities that have implemented RFID self-help circulation services in their libraries and which had found that it was too easy to bypass the tag security. This is supported by the views expressed by Bansode and Desale (2016:6), Butters (2008:203), Dawes (2004:11), Driscoll (2005:90), Howard and Anderson (2005:31), McDonald (2011:28) and Singh and Midha (2008:445). However, even though the tags are not used for securing books, it seems that some library users still try to remove or damage the tags so as to most probably steal the books.

With the above in mind, libraries need to decide whether all library staff with access to RFID staff workstations should also be expected to do tagging in cases where tags are removed or damaged. Libraries also need to decide whether the RFID tags will be used for securing books, with the various pros and cons being considered. As the RFID technology develops it is also possible that RFID tags may in future be used more effectively for security purposes. Where libraries decide not to use the RFID tags for security, awareness must be created among library users that the RFID tags are not used for this purpose. This will prevent tags from being unnecessarily removed or damaged.

5.4.2 Training

In the literature study conducted in Chapter 2, Section 2.3 the importance of training during and after the project implementation was emphasised. In the case of this study, training of library staff as part of the implementation of the RFID self-help circulation services was the responsibility of the two companies awarded the tenders. New library staff received in-service training. Training by circulation library staff of library users also

occurred as part of familiarising library users to the use of the RFID self-help circulation services.

5.4.2.1 Training received by circulation librarians in the use of the RFID self-help circulation services

The statistics cited in Chapter 4, Table 4.33 indicate that 91.67% of the circulation librarians had received training in the use of the RFID self-help circulation services. Of these, 95.45% indicated that training had contributed to them being able to assist library users in the use of self-help circulation services. Even the 4.17% of circulation librarians who had not received training indicated that training would have helped them to assist library users. It is therefore clear from the statistics that training of circulation staff is very important. Just 4.55% of the circulation staff who had received training indicated that training did not contribute in enabling them to assist the library users. Hence, it is clear that libraries have to ensure that well-planned training of circulation librarians in the use of the RFID self-help services takes place to enable them in turn to assist library users. Staff training should be part of the implementation project and should be the responsibility of the RFID company because it knows the equipment and software best, and should be formally structured. However, it is also crucial that the tender specifications state that company trainers are certified to present training. It is also important that the training is monitored by allocated library staff to ensure that it is of high quality and suits library staff needs. On-going in-service training for new library staff should also be assured by having a structured in-service training plan.

5.4.2.2 Training received by library users in the use of the RFID self-help circulation services

In Chapter 4, the statistics reflected in Table 4.34, regarding the training of library users, show that the majority of respondents had not received training in the use of the RFID self-issue services. Chapter 4, Table 4.36 shows that the majority of students who had not received training also did not use the self-issue services (52.89%). Of the majority of staff user respondents who had not received training, 29.9% did not use the self-issue services (see Chapter 4, Table 4.37). Of the majority of staff who were also Unisa students that did not receive training, 30.56% did not use the self-issue services (see Chapter 4, Table 4.38).

The great majority (more than 90%) of all the user categories of respondents that did receive training also indicated that the training enabled them to use the self-issue services (see Chapter 4, Table 4.34). This is confirmed in Chapter 4, Table 4.36 where it was indicated that 25.72% of the students that received training also used the self-issue services and only 0.41% of the students that received training did not use the self-issue service. The same is true for the staff user respondents, where 37.11% of the staff users had received training and used the self-issue service and only 5.16% had received training and did not use the self-issue services (see Chapter 4, Table 4.37). This trend is confirmed in Chapter 4, Table 4.38 for staff who were also Unisa students. So, 25% of this group had received training and used the self-issue services while only 2.78% had received training and did not use the self-issue services. This also confirms the importance of training.

However, although not the majority, a high number of respondents in the staff and student library user categories who had not received training indicated that training would not have enabled them to use the self-issue service (see Chapter 4, Table 4.34). The respondents in the staff who were also Unisa students category was the only group where there was no clear majority either way regarding not receiving training and indicating that training would not or would have enabled them in the use of the RFID self-issue services (see Chapter 4, Table 4.34). Half of the respondents indicated that training would have enabled them and half indicated that training would not have enabled them in this regard. Reasons for the high occurrence of responses by the staff, student and staff who were also students users in Chapter 4, Table 4.34 indicating that they did not receive training and that training would not have enabled them in using the self-issue services were found in some of the respondents' qualitative statements. The reasons that were identified for this phenomenon were the following:

- Respondents did not use any form of library services.
- Respondents did not issue or return books to themselves from the library. In this case most respondents indicated that they used the library only for study purposes. It was generally undergraduate, diploma and certificate students who indicated that apart from prescribed course material they did not need any additional library material. Some respondents also indicated that they would

rather use books in the library as they are afraid that they might be damaged if they took them home.

- Respondents only requested books from the Unisa Library's online catalogue and then returned them using courier or mail.

- Respondents only accessed the library online e-resources.

In these cases, training would not have made any difference to the use of the self-issue services. During planning, libraries therefore need to take into account the estimated number of users that might not make use of the RFID self-issue services. This will assist in planning the number of self-issue machines that will be needed and will therefore also affect the cost of acquiring the machines. This might be done, for example, by liaising with university academic departments regarding which courses might not necessitate students to issue books from the library. This can of course be a time-consuming process and it must be taken into consideration whether the time spent obtaining such information is justified in comparison with the cost of the equipment.

18.72% of the students indicated that they had not received training but still used the self-issue services (see Chapter 4, Table 4.36). 23.71% of the staff respondents indicated that they had not received training but used the self-issue services (see Chapter 4, Table 4.37). 37.5% of staff who were also Unisa students indicated that they had not received training but used the self-issue services (see Chapter 4, Table 4.38). The reason for this phenomenon can also be found by examining the qualitative information supplied by the respondents. Some respondents indicated that they did not need training as the self-issue services were easy enough to use. This is confirmed by the statistics displayed in Table 8, Chapter 4 where the majority of user respondents indicated that the self-issue services were easy to use. However, despite the ease of use it is still important that libraries make the training of library users a priority. It is better to schedule formal training, for example as part of the library orientation programme. Depending on the effectiveness of the marketing of the RFID self-issue services, library users can decide whether they need the training or not. Overall, the statistics indicate that training is crucial in enabling users to use the self-issue services.

An analysis of the data displayed in Chapter 4, Table 4.35 makes it clear that the great majority of the respondents indicated that they had not received training in the use of

the self-return services. Chapter 4, Table 4.36 illustrates that the majority of students who had not received training did not use the self-return services (59.67%). Of the staff respondents that did not receive training, 34.02% did not use the self-return services (see Chapter 4, Table 4.37). Of the staff who were also Unisa students that did not receive training, 38.89% did not use the self-return service (see Chapter 4, Table 4.38). The majority of the respondents that did receive training also indicated that the training enabled them in using the self-return services (see Chapter 4, Table 4.35). This is also confirmed in Chapter 4, Table 4.36 where it is shown that 15.64% of the students had received training and used the self-return services and only 0.62% of the students that had received training did not use the self-return services. This is also true for staff respondents where 24.74% of the staff users received training and used the self-return services and only 4.12% received training and did not use the self-return services (see Chapter 4, Table 4.37). The same trend is also confirmed for staff who were also Unisa students (see Chapter 4, Table 4.38). Of this group 13.89% received training and used the self-return services and none of them received training and did not use the self-return service. This confirms the importance of training.

Regarding the question of whether training would have enabled the use of the self-return services where respondents did not receive training, the majority of the students and staff who were also Unisa students indicated that training would have enabled them in the use of the self-return services (see Chapter 4, Table 4.35). Only in the staff category did quite a big majority – 56.9% of the respondents indicate that training would not have enabled them to use the self-return services. Similar reasons for these high responses of staff users regarding training not enabling them were found in some of the respondents' qualitative statements as with self-issue services.

22.02% of the students indicated that they did not receive training but still used the self-return services (see Chapter 4, Table 4.36). 33% of the staff respondents indicated that they had not received training but used the self-return services (see Chapter 4, Table 4.37), as did 43.06% of the staff who were also Unisa students (see Chapter 4, Table 4.38). The reason for this phenomenon can also be found by investigating the qualitative information. Some respondents indicated that they did not need training as the self-return services were easy enough to use. This is especially true in the case of the self-return services where library users indicated that it was an even easier process

with clear on-screen instruction for returning library material. This is also confirmed by the statistics displayed in Chapter 4, Table 4.10 where a large majority of respondents indicated that the self-return services were easy to use. However, it is still important for libraries to make the training of library users a priority even though the RFID self-help circulation services might be easy to use. It is better to schedule formal training, for example as part of the library orientation programme. Depending on the effectiveness of the marketing of the RFID self-help circulation services library users can decide whether they need the training or not. Overall, the statistics indicate that training is crucial in enabling users to use the self-return services.

5.4.3 Problems encountered with the use of the RFID self-help circulation services by library users and staff

In the literature study conducted in Chapter 2, Section 2.3 problems with the RFID self-help circulation services were found to be a factor. These are discussed below:

In Chapter 4, Section 4.10.4.1 the problems library users encountered while using the RFID self-help circulation services were analysed. The three categories of users were again used to establish what types of problem each user group encountered while using the self-issue and self-return services respectively. In Chapter 4, Section 4.10.4.2 the problems circulation librarians encountered while assisting library users in using the RFID self-help circulation services were analysed, as were the responses obtained from systems librarians during support and maintenance of the RFID self-help circulation services equipment and integration of the self-help services with the LMS.

A Likert scale was used to analyse data pertaining to library staff responses. The negativity with which each problem was experienced was measured on a scale of 1–5, with 1 on the scale being “Very negative” and 5 being “Not negative at all”. Negativity was determined by the frequency of problems experienced by library staff. The analysis of responses from circulation librarians and systems librarians was tabulated as a combined total for both user groups (see Chapter 4, Table 4.41).

5.4.3.1 Self-issue services problems

From the results shown in Table 4.39 in Chapter 4, it is clear that far fewer students, staff and staff who were also Unisa students using the self-issue services experienced

problems per problem category than those that did experience problems. Library staff's experiences regarding problems encountered with the self-issue services is not as clear cut as users of the self-issue services. This will, however, become clearer as each problem category is discussed.

In comparison, the only problem category in which the difference was not that great for the respective self-issue services user categories that experienced problems and those that did not, was the "Self-issue machine was not working" category. The same trend is true in the case of library staff.

5.4.3.1.1 Self-issue machine was not working

Chapter 4, Table 4.39 illustrates that in this category 56.76% of students did not experience this type of problem compared with 43.24% that did.

This is the only problem category in which more staff users experienced problems than staff who did not experience problems. In this category, 58.33% of staff self-issue services users experienced this type of problem with 41.67% that did not experience problems. 44.68% of staff members who were also Unisa student self-issue services users experienced this type of problem, with 55.32% that did not.

Analysis of the results in Chapter 4, Table 4.41 obtained by using the Likert scale method illustrates clearly that the majority of the library staff did not experience many problems in the problem category "Self-issue machine was not working". Library staff's experiences regarding this problem corresponds with that of the students and of the staff who were also Unisa students. The library staff's experiences with this problem does not correspond with the staff self-issue services users' experiences, however, as the majority of respondents in the latter library user category experienced more problems.

To ensure that the periods when RFID self-issue services are unavailable for long periods due to this problem, it is crucial that libraries ensure that a comprehensive maintenance contract with the RFID support company is in place. Where more than one RFID services system is in place, a maintenance contract with each company needs to be in place. As part of the maintenance contract it should be stipulated that technicians have to be available to maintain RFID self-issue equipment at all sites within an agreed

time-frame. It should also be stipulated clearly in the maintenance contract that replacement components for the RFID self-issue equipment must be available in the country and where it is not reasonable to expect that, the delivery time of replacement components from overseas should be stipulated. This is also important in the case of the problem “Self-return machine was not working” discussed in Section 5.4.3.2.1.

The other problem types can of course not be ignored even though they were experienced by the vast minority of self-issue services users in relation to the users that did experience problems in those problem categories. The trend regarding library staff who experienced either more or fewer problems in these problem categories is not the same as for the self-issue services users. The analysis of the library staff’s experiences regarding these problems is discussed further for each problem category.

5.4.3.1.2 User card not read by the self-issue machine

The “Self-issue machine indicated a problem with user’s university ID card” problem category was experienced by less than one-fifth of the self-issue services student user respondents and just more than one-quarter of staff and staff who were also Unisa students user respondents. More library staff respondents indicated that they experienced many problems in this category – 47.83% in comparison with 34.78% that did not experience many problems. This does not confirm the experience of the student, staff and staff who were Unisa student user respondents for this problem category.

In most cases this problem indicates a problem with the user card itself or a problem with the library system patron record. Users of Unisa Library Services use their university access cards to be identified as library users on the LMS. The library needs to clearly highlight to the card issuing department of the university the requirements regarding the library user information that needs to be available on the card. The fact that the card should allow the RFID self-issue machines to read the chipset on the card should be emphasised. Smart cards have chipsets that makes proximity scanning of the cards possible while non-smart cards need the barcode on the card to be scanned. Smart cards make the identification of users on the LMS via the RFID self-issue machines easier. The user information that is necessary to identify the user on the LMS should be incorporated on the chipset and should include at least the library user’s university identification barcode number to facilitate identifying the user correctly on the

LMS. In Unisa Library Services' case the university identification barcode on the cards, which are not incorporated in the chipsets, had to be used to identify a library user on the LMS. The reason is that Unisa still has to implement smart card technology.

Any changes to the university ID card should still cater for the correct identification of the library user on the LMS when using the user card. In Unisa Library Services' case a change was made to the university identification barcode number. A zero was added to the beginning of the barcode number by the department responsible for issuing university access cards to users. This caused the barcode number not to be identifiable by the LMS. The user then had to go to the library manual circulation desk so that the barcode number could be typed in the LMS by a library circulation staff member without the zero. The circulation librarians then requested the library acquisitions section to print a barcode with no zero. This is then put onto the user card to replace the existing barcode. This wastes the user's time and might cause the library user's satisfaction with the self-issue services to be negatively affected. As part of the implementation planning it is crucial that all the above-mentioned considerations regarding the user cards be taken into consideration to ensure effective identification of users with the least interruption to the self-issue services.

5.4.3.1.3 User PIN not accepted by the self-issue machines

The problem category "Self-issue machine did not accept user's PIN" was experienced by only 14.41% of students, a third of staff users and 27.66% of staff who were also Unisa students. Library staff respondents indicated that they experienced more problems in this category – 45.83% versus 37.5%. This does not confirm the experience of student, staff and staff who were also Unisa student user respondents for this problem category.

Unisa Library Services used the option of a PIN in addition to identifying a user by using the university identification card. This adds a second layer of authentication during identification of the library user when using the self-issue services. The PIN is a code that is chosen by the user through the online library catalogue or is allocated by circulation librarians using the LMS. The self-issue services will deny the user access if the PIN is entered incorrectly. The user will then have to go to the manual circulation desk to get assistance from staff with changing the PIN. This is a user-related issue that

will differ from user to user depending on their familiarity and confidence in using the self-issue services. Users might experience the self-issue service as negative if the PIN is rejected by the machine too often. Time will be wasted changing the PIN or getting assistance from circulation librarians to change the PIN. Libraries need to decide if the extra authentication of using a PIN is justified or if using identification through user cards only when using the self-issue services, is enough to safeguard the user's private information. Training is also important to ensure that users know how to create and use the PIN.

5.4.3.1.4 Problems with books during self-issue

"Problem with book during self-issuing" was experienced by the greater minority of respondents. Only 12.61% of the students, 23.33% of the staff users and 15.22% of the staff who were also Unisa students experienced this type of problem. The minority of the library staff respondents indicated that they experienced many problems in this category. In cases where "Problem with book during self-issuing" were experienced the problem generally involved books that were not allowed to be issued to library users due to restrictions on their circulation, books with no tags and books with tags containing incorrect information.

Libraries need to ensure that books that are not supposed to be issued to library users are indicated as not available through clear signage and if possible keeping such books separate. As already shown in Chapter 4, Section 4.10.2 it is crucial that libraries have quality control built in as part of the tagging sub-project to limit tagging problems with books. Chapter 4, Tables 4.24 to 4.26 clearly show that circulation librarians were still finding books with tagging problems using the RFID staff workstations and when assisting users during use of the RFID self-help circulation services even five years after RFID implementation had started. These type of problems will also lead to more time spend by library self-issue users as they will need to take these problem books to the manual circulation desk to resolve the problem.

5.4.3.1.5 Problems with the user's library account

"Self-issue machine indicated problems with the user's library account" were experienced by far fewer self-issue user respondents. In this problem category, less than 10% of the respondents in the three library self-issue services user respondent

categories experienced problems. Library staff respondents indicated that they experienced more problems in this category – 34.78% of respondents experienced many problems and 21.74% experienced fewer problems. This does not confirm the experience of student, staff and staff who were also Unisa student user respondents for this category.

This problem usually occurred when users were blocked by the LMS due to any of the system or manual blocks that could be set to prevent a user from issuing books. Examples are a user block because of a high fine, a block related to the limit of library material that may be issued to a user and so forth. To prevent unnecessary disruption of self-issue services these user blocks need to be re-examined by libraries to ensure that these blocks are valid and realistic. However, these user blocks have a specific purpose and should not be changed except for the purpose of ensuring limitation of disruption to self-issue services.

5.4.3.1.6 No due date slips printed during self-issue

“Self-issue machine did not print due date slips” was experienced by very few user respondents, with less than 14% of the students, less than 19% of the staff and less than one-third of the staff who were also Unisa students users experiencing this problem. 47.83% of library staff respondents indicated that they experienced fewer problems and 30.44% indicated that they experienced many problems. This confirms the experience of the students, staff and staff who were also Unisa student user respondents for this category.

This type of problem might have occurred because the printer paper in the machine was depleted or as a result of a mechanical problem with the printer. To minimise this type of problem, libraries need to ensure that they have a system in place that will enable detection of problems with the printing of the due date slips. One way of doing this is to ensure that the self-issue machine is placed where circulation librarians can easily monitor any problems experienced. This is discussed in more detail in the section on the placement of self-help machines in Section 5.3.5. An additional way is to ensure that the self-issue machines have the ability to notify staff of a problem by sending an error message to selected circulation librarians’ e-mail addresses. The self-issue machines obtained from the second tender in 2013 have this functionality. A library needs to

ensure that this functionality is included in the technical specifications during the implementation planning phase.

5.4.3.1.7 Tags were not desensitised during self-issue

“Tags were not desensitised by the self-issue machine” also known as “User not allowed through security gate” were also experienced by a minority of the user respondents. Less than 12% of the students, 15% of the staff and less than a quarter of the staff who were also Unisa students experienced this problem. Library staff respondents indicated that they experienced fewer problems in this category, 37.5% indicated they encountered not many problems and 36.33% experienced many problems. This confirms to a certain extent the experience of student, staff and staff who were also Unisa student user respondents for this category.

This problem stems from a mechanical problem with the self-issue machine, as the desensitiser unit of the machine does not always desensitise the EM security strips in the books, thus preventing users from passing through the security gates. Time is wasted and the books must be desensitised at the manual circulation desk.

In conclusion: Tables 4.4 and 4.5 in Chapter 4 show that in all three library user categories and the two library staff categories far more respondents rated a combined total of 4 or 5 on the Likert scale (satisfied) than those that rated a combined total of 1 or 2 on the scale (not satisfied). The high rate of satisfaction is confirmed by the fact that the overwhelming majority of self-issue user respondents in all three user categories indicated that they did not experience problems during the use of the self-issue services. It was only in the problem category, “Self-issue machine was not working”, that the staff users experienced more problems. The majority of library staff experienced many problems in three problem categories. These categories are “Self-issue machine indicated a problem with user’s university ID card” – Section 5.4.3.1.2, “Self-issue machine did not accept user’s PIN” – Section 5.4.3.1.3 and “Problems with the user’s library account” – Section 5.4.3.1.5. Overall, the experiences of self-issue users and library staff in the problem category “Machine out of order” indicate more technical problems being experienced with the self-issue services.

5.4.3.2 Self-return services problems

From the analysis of the results shown in Chapter 4, Table 4.40 it is clear that far fewer students, staff and staff who were also Unisa students using the self-return services experienced problems per problem category than those that did not experience problems. Library staff's experiences regarding problems encountered with the self-return services are not as clear cut as those of users. This will become clearer as each problem category is discussed.

In comparison, the only problem category in which the difference was not that great for the respective self-return services user categories that experienced problems and those that did not, was the "Self-return machine was not working" category. The same trend is true in the case of library staff.

5.4.3.2.1 Self-return machine was not working

52.36% of student self-return services users did not experience this type of problem with 47.64% indicating that they experienced problems. The only problem category in which more staff users experienced problems – 56.9% than staff who did not – 43.1% was the "Self-return machine was not working" category.

The ratio of staff who were also Unisa students that experienced problems to those that did not experience problems with this problem category is 50:50.

During the analysis of the results displayed in Chapter 4, Table 4.41 and obtained using the Likert-scale method it was found that the majority of library staff – 54.16% did not experience many occurrences of the "Self-return machine was not working" problem. 33.33% however, experienced many occurrences of this problem. Library staff's experiences regarding this problem correspond with the experiences of the student self-return services users.

The other problems can of course not be ignored even though they were experienced by the vast minority of self-return services users in relation to the users that did not experience problems in those problem categories. The trend regarding library staff who experienced either many or fewer problems in these problem categories is not the same as for the self-return services users. The analysis of the library staff's experiences regarding these problems is detailed in the further discussion of each problem category.

5.4.3.2.2 Problems with books during self-return

The “Problem with book during self-returning” category was experienced by less than 13% of student self-return user respondents, less than a quarter of staff users and less than 17% of staff who were also Unisa students. The percentage of library staff who experienced many problems in comparison to those that did not experience many was the same – 37.5%. Therefore library staff’s experiences regarding this problem do not correspond with students, staff and staff who were also Unisa student users’ experiences.

In most cases this problem indicates a problem with books with no tags and books with tags that have incorrect information. As already found in Chapter 4, Section 4.10.2 it is crucial that libraries have quality control built in as part of the tagging project to limit the occurrence of books with tag problems. Chapter 4, Tables 4.24 to 4.26 in particular show clearly that circulation librarians still found books with tagging problems using the RFID staff workstations and when assisting users during use of the RFID self-help circulation services even five years after RFID implementation had started. This type of problem will also lead to library staff having to spend more time on correcting tag problems and books being out of circulation.

5.4.3.2.3 No receipts printed during self-return

The problem, “Self-return machine did not print receipts”, was experienced by a minority of self-return user respondents. Less than a quarter of students, 28.07% of staff and nearly 43% of staff who were also students experienced this problem. The majority of library staff respondents experienced few problems in this problem category. The library staff’s experiences with this problem correspond with all three self-return services user categories’ experiences.

This type of problem might occur because the printer paper in the machine is depleted. It can also occur as a result of a mechanical problem with the printer. To minimise this type of problem, libraries need to ensure that they have a system in place to detect problems with the printing of the due date slips. One way is to ensure that the self-return machine is placed where circulation librarians can monitor any problems experienced easily. With self-return machines, this is not always possible as they should be placed where they can be accessed after hours. The machines are also generally placed at the

entrance to the library so users do not need to enter the library to return books. For a further discussion on the placement of self-return machines see Section 5.3.5. An additional way is to ensure that the self-return machines have the ability to notify staff of a problem by sending an error message to selected circulation librarians' e-mail addresses. The self-return machines obtained from the second tender in 2013 have this functionality. A library needs to ensure that this functionality is included in the technical specifications during the implementation planning phase.

5.4.3.2.4 The return bin was full

The problem, "Books could not be returned as return bin was full", was experienced by the vast minority of self-return user respondents. Less than 4% of students, less than 9% of staff and just more than 7% of staff who were also Unisa students experienced this problem. The majority of library staff indicated that they did not experience many problems in this regard. The library staff's experiences regarding this problem correspond with the experiences of the self-return users.

To minimise this type of problem, libraries need to ensure that they have a system in place to detect when the return bin is full. With self-return machines, it is not always possible as these machines should be placed as far as possible where it will be available after hours. The machines are also generally placed at the entrance to the library so users do not need to enter the library to return books. This is discussed in the section on placement of self-return machines (see Section 5.3.5). An additional way would be to ensure that the self-return machines can notify staff of when the return bin is full by an e-mail to selected staff members. The self-return machines obtained from the second tender in 2013 have this functionality. Libraries need to ensure that the RFID system chosen includes this functionality.

In conclusion: Tables 4.6 and 4.7 in Chapter 4 illustrate that in all three library self-return user categories and the two library staff categories far more respondents rated a combined total of 4 or 5 on the Likert scale (satisfied) than those that rated a combined total of 1 or 2 (not satisfied). The high rate of satisfaction is confirmed by the fact that the overwhelming majority of respondents in all three user categories indicated that they did not experience problems during use of the self-return services. It was only in the problem category of "Self-return machine was not working" that the staff users

experienced more problems. The majority of students did not experience problems in this problem category. The staff who were also Unisa students users' experience with this type of problem experienced was 50:50. Library staff's experiences with the self-return problem categories are in all cases except one the same as the three user categories. In the "Problem with book during self-returning" problem category, the percentage of library staff that experienced many problems versus those that did not was the same – 37.5%.

5.4.4 Using two different RFID systems at Unisa Library Services

At Unisa Library Services two different RFID self-help circulation systems were in use. Analysis of the data in Chapter 4, Table 4.42 shows that the majority of acquisitions tagging staff, circulation librarians and shelving staff did not experience any difficulties or problems with using the two different RFID systems. However, the majority of delivery staff and the systems librarians did experience problems with using two RFID systems.

From the library staff's comments, it is clear that in the delivery section two types of RFID staff workstations were implemented. Staff indicated that the old workstation was not being used anymore as the difference between the old and the more advanced workstations was too big. One circulation staff member indicated that the difference between the procedures used on the two types of RFID self-help machines and the staff workstations was too big and their use led to problems. The systems librarians commented that the biggest problem with having to support and maintain two different RFID systems and equipment was the different problem reporting procedures in use by the two companies. One of the systems librarians also indicated that it is more difficult to maintain and support two different RFID systems and equipment as the procedures and functioning for the old and the new systems and equipment are very different.

From the above it is clear that it is important that libraries consider the difficulties involved in using two different RFID self-help circulation systems. Although not the overall majority, some Unisa library staff indicated that they experienced problems due to the difference in functionality of and the procedures for the different RFID systems and equipment. Even administrative differences like reporting problems to the different RFID companies should be taken into consideration.

It is also important that the on-screen instructions on the RFID self-help circulation services are clear enough to make the use of the two different systems not that difficult.

5.4.5 Accessibility of self-help services

5.4.5.1 Accessibility of self-issue services

Library users were approached to ascertain whether they felt that self-issue services were accessible. Table 4.43 in Chapter 4 displays an analysis of the self-issue services users' responses. The majority of students, nearly 70%, indicated that the RFID self-issue service machines were placed in an accessible position, as did 73.33% of staff users and 84.78% of staff who were also Unisa students. This is also reflected in the analysis of the statistics in Chapter 4, Table 4.4, which indicates that the majority of self-issue services users were satisfied with the self-issue services.

Libraries need to ensure that self-issue machines are placed where they are most accessible to library users. The best place is usually where users will notice the machines easily and where they are not obstructed by other equipment or furniture. They should also be in sight of the manual circulation desk so that librarians can offer assistance to self-issue services users. If this is not possible, libraries have to ensure that the service is marketed effectively so that users will know about the self-issue services and where they can approach circulation librarians for assistance.

5.4.5.2 Accessibility of self-return services

Library users were approached to ascertain whether they felt that the RFID self-return services were accessible. In Chapter 4, Table 4.44 displays an analysis of self-return services users' responses. Accordingly, 71.96% of students, 92.99% of staff users and 85.71% of staff who were also Unisa students respondents indicated the machines were placed where they were accessible. This is also reflected in the analysis of the statistics in Chapter 4, Table 4.6 which indicates that the majority of users were satisfied while using the self-return services.

Libraries need to ensure that the self-return services machines are placed where they are most accessible to library users. The best place is usually where users will notice the machines easily and where they are not obstructed by other equipment or furniture. They should also be in sight of the manual circulation desk so that librarians can offer

assistance to self-issue services users. If this is not possible, libraries have to ensure that the service is marketed effectively so that users will know about the self-issue services and where they can approach circulation librarians for assistance.

5.4.6 Catering for books returned to Unisa libraries that are not the owner library

Unisa Library Services allows the return of library material at any of the Unisa campus libraries. With the implementation of the RFID self-help circulation services, library users were also able to return books using these self-help services on any of the campus libraries that have these services.

Analysis of the circulation librarians' qualitative responses in Chapter 4, Section 4.10.7 led to the identification of an important implication of the use of the self-return services. Identification of the owner library of books that are returned via the self-return services did not become easier for circulation librarians at a Unisa library with self-return services. Circulation librarian respondents indicated that in most cases there was no way for them to identify the owner library of a book just by checking the book. Some books have a stamp inside to indicate which Unisa library the book belongs to. However, there are also many books without these stamps. Books are also moved occasionally between the libraries. Hence, after the return bin is removed from the self-return machine, the books have to be checked in on the LMS again to ascertain where the book belongs.

Before the implementation of self-return services at Unisa campus libraries, books were returned using the LMS at the manual circulation desk and library ownership was identified using this system. Owing to the inability to identify the owner library in most cases after a book was returned using the self-return services, duplication of the return process occurs. Circulation librarians need to return these books again on the LMS to ascertain ownership even though the items have already been returned using the self-return services.

One option to consider to address this shortcoming is to install a RFID sorter machine at each self-return machine. Books can then be sorted with pre-established criteria which will make it possible to sort books that do not belong to the library where it was returned in a separate bin/s. However, supplying machines for each library for this purpose would

be very expensive. Another option might be to ensure that each book has a stamp that identifies the owner library. Consideration can also be given to include an indication of the owner library in the spine label by using a code for each library as a prefix. However, that in turn will mean that the spine label will have to be changed for these books. Processing of Unisa Library Services books are done at the Muckleneuk library. This means that books will have to be first send to the Muckleneuk library for the spine label change on the book itself and on the LMS.

5.4.7 Privacy concerns regarding the use of self-issue services

During the literature study in Chapter 2 (see Section 2.3), it was found that some users of libraries internationally have privacy concerns when using the RFID self-issue services. Users are concerned that their private information might be compromised during the user identification process on the self-issue machines. Analysis of the library self-issue services users' responses in Chapter 4, Table 4.45 indicate that most respondents did not have any such concerns. However, just less than 13% of respondents indicated that they did have privacy concerns.

Libraries therefore need to ensure that library users will not feel reluctant to use the self-issue services because of privacy concerns. Marketing and training of library users in the self-issue services should cater for user awareness regarding privacy concerns and the use of the services.

5.4.8 Change in circulation librarians' roles and responsibilities

In the literature study in Chapter 2, Section 2.3 possible changes in library staff roles or responsibilities were highlighted as a factor that need to be considered when deciding to implement a RFID self-help circulation services system. Circulation librarians' responses were analysed in Chapter 4, Figure 4.6.

The majority of circulation librarians experienced a change in their roles or responsibilities after implementation of self-help circulation services. The changes mostly entailed a move from predominantly circulation activities to training of library users in online information retrieval. The user training also included instruction in the use of the RFID self-help circulation services.

Libraries need to ensure that possible changes in the roles or responsibilities of library staff are considered before obtaining a RFID self-help circulation services system. Change management becomes very important during implementation to prepare library staff for any change in roles or responsibilities.

5.5 ADVANTAGES AND DISADVANTAGES OF USING RFID SELF-HELP CIRCULATION SERVICES

Certain advantages and disadvantages that had an influence on the RFID self-help circulation services are discussed and interpreted further in the following sections.

5.5.1 Time saved by using self-help circulation services

5.5.1.1 Time saved by library users by using self-issue services

During the literature study conducted in Chapter 2, Section 2.4.1 the literature indicated that time is saved when users use the self-issue services. Analysis of the data in Chapter 4, Table 4.46 illustrates that a large majority of library user respondents saved time by using the self-issue services instead of the manual circulation desk. When users save time using the self-issue services, libraries can have fewer manual circulation desk librarians and rather use the additional staff to assist users with the more specialised services the library offer. In addition, users will be more positive towards the self-issue services and the library services in general. This is confirmed by the high satisfaction rate as shown after analysing the data in Chapter 4, Table 4.4.

This is definitely an advantage that should be considered by libraries when investigating and making decisions on whether to obtain RFID self-help circulation services.

5.5.1.2 Time saved by library users by using self-return services

During the literature study conducted in Chapter 2, Section 2.4.1 the literature indicated that time is saved when users use the self-return services. Analysis of the data in Chapter 4, Table 4.47 illustrates that a large majority of library user respondents saved time using the self-return services instead of the manual circulation desk. When time is saved while using the self-return services, libraries can have fewer manual circulation desk librarians and use the additional staff to assist users with the other services the library offer. If users save time by using the self-return services, this will mean that their attitude towards the self-return services and the library services in general will be more positive. This is also confirmed by the high satisfaction rate shown by the data analysed in Chapter 4, Table 4.6.

This is definitely an advantage that should be considered during decision-making by libraries when investigating RFID self-help circulation services with a view to obtaining them.

5.5.2 Using tags versus barcodes during issuing and return

According to the literature study conducted in Chapter 2, Section 2.4.1 RFID tags make circulation of items easier than barcodes. After analysing the data in Chapter 4, Figures 4.7 and 4.8, it was found that a big majority of circulation librarians and delivery staff respondents indicated that RFID tags make the issue and return of books easier than when barcodes in books are used. This means that RFID self-help circulation will also be easier than using the manual circulation desk.

This advantage should certainly be considered when libraries investigate RFID self-help circulation services and make decisions regarding their purchase.

5.5.3 Using RFID tags for security purposes

During the literature study in Chapter 2, 2.4.2 it was found that there is no consensus on the use of RFID tags for securing items. Due to the size of the tags it is very visible. If security is incorporated on the tags, the biggest disadvantage will be that the tags can be easily removed. Hence the items can then be removed from the library without authorisation. This is confirmed in Tables 4.17, 4.20, 4.23, 4.26, 4.29 and 4.32 where the high occurrence of tags being removed or damaged since implementation was confirmed.

Other problems with using tags for security purposes were identified during the interviews with the systems librarians. Foil placed over the tags can disable the ability of the security gates to read the security feature on the tags. If tags in different items being self-issued are aligned with each other, it might also interfere with the effective reading of the security information on the tags by the security gates. Therefore, at Unisa Library Services the use of RFID tags for securing items were not found to be an advantage.

For this reason Unisa Library Services decided against the use of RFID tags for security purposes. Libraries need to investigate the advantages and disadvantages of the use of RFID tags for securing items before implementing a RFID self-help circulation services system.

5.5.4 Renewal of books by using the self-issue services

In Chapter 4, after analysing the responses of circulation librarians (see Figure 4.9) and systems librarians in Chapter 4, Section 4.11.3 it was ascertained that the Unisa Library Services' RFID self-issue services do not allow for the renewal of books. This is due to a limitation in the LMS SIP2 protocol that does not cater for the renewal function by the self-issue services. Books can be indirectly renewed by issuing the book again using the self-issue services.

Libraries should ascertain whether books can be renewed by using the self-issue services as part of the planning and decision-making process. In the case of Unisa Library Services this is not an advantage as it is not possible to renew books in this way.

5.5.5 RFID self-help circulation services and audio-visual material

Analysis of the quantitative data in Chapter 4 (see Table 4.48) shows that nearly 80% of the circulation librarian respondents indicated that they realised that audio-visual material should not be issued using the RFID self-issue services, while 62.5% of these respondents indicated that they realised that audio-visual material should also not be returned using the self-return services.

After further investigation of the qualitative responses in Chapter 4, Section 4.11.4 the circulation and systems librarians indicated that audio-visual material was not circulated via the self-help services but at the manual circulation desk because the circulation librarians need to check if any accompanying material is present during issue and return, as well as to prevent data on the material from being damaged by the electromagnetic field used by the self-issue service. At the Unisa Muckleneuk library the audio-visual material is kept separately in the audio-visual section. This makes it easier to issue the audio-visual material at the audio-visual section's manual circulation desk. Audio-visual material should not be returned via the self-return machines as it can be damaged when dropped into the return bins.

Libraries need to ensure that library users are informed that audio-visual material must not be issued and returned using the self-help circulation services. The best way to do this is to place posters with specific instructions at the self-help machines relating to

audio-visual material. Libraries also need to ensure that the on-screen instructions on the self-help machines are clear on the self-issue and return processes. Training would also be the ideal way to highlight this restriction. This again emphasises how important training and marketing are during implementation and post-implementation. It should also be noted that 25% of the circulation librarian respondents were under the impression that audio-visual material could be returned via the self-return services, while 12.5% of the circulation librarians were under the impression that such material could be issued using the self-issue services. This again indicates a lack of sufficient formal and/or informal training of circulation librarians.

From the above it is clear that due to the nature of the RFID self-help circulation services and the library material, RFID self-help services are not an advantage in the case of audio-visual material.

5.5.6 Self-issue and return of more than one book simultaneously

From Chapter 4, Table 49 it is clear that nearly 80% of the circulation librarian respondents indicated that not more than one book could be simultaneously issued or returned using the RFID self-help circulation services. Systems librarians indicated that the reason for not issuing more than one book simultaneously was that although all the books would be desensitised not all would be issued on the LMS. Self-return machines can return only one book at a time.

Libraries should put up posters with clear instructions next to self-help circulation machines to inform users that not more than one book can be issued or returned at a time. This should also be emphasised during library user training. Libraries also need to ensure that the on-screen instructions on the self-help machines are clear on the self-issue and return processes. This again emphasises how important the training of library users and marketing of the self-help services are in the implementation process. It should also be noted that just more than 20% of the circulation staff were under the impression that more than one book could simultaneously be issued via the self-issue services, while 12.5% were under the impression that more than one book could simultaneously be returned using the self-return services. This again indicates a lack of sufficient formal and/or informal training of circulation librarians.

Therefore, owing to the nature of the RFID self-help circulation services and the library material, self-issuing and returning of more than one book simultaneously is not possible and therefore not an advantage.

5.5.7 Sensitising and desensitising the EM security strips in books using the RFID self-help circulation services

Analysis of the data in Chapter 4, Table 50 shows that nearly 80% of the circulation librarians indicated that the RFID self-issue machines could desensitise the EM security strips within books. Two-thirds of the circulation librarians indicated that the self-return machines cannot sensitise the EM security strips within books. In Chapter 4, Section 4.11.6 the systems librarians confirmed this. The self-return machines cannot sensitise security strips due to a technological limitation. Automatic desensitising of security strips while using the self-issue services is an advantage that makes it possible for users to issue books and simultaneously desensitise the security strips in the books without any manual intervention from staff. The inability of self-return services to sensitise the security strips when books are returned is a disadvantage.

Libraries need to take the above two advantages/disadvantages into consideration when planning the RFID self-help circulation processes. The fact that the self-return services cannot sensitise EM security strips mean that the circulation librarians will still have to sensitise the security strips in books received from the self-return services.

What also needs to be noted is the fact that just more than 20% of the circulation librarians were under the impression that the self-issue machines could not desensitise the EM security strips in books. A third of the circulation librarians were also under the impression that the self-return machines could sensitise security strips. This again indicates a lack of sufficient formal and/or informal training of circulation librarians. The lack of awareness of this functionality or absence of functionality will lead to staff spending time on an activity that is not necessary or not performing an activity that has to be done.

5.5.8 Inventory control

The literature study in Chapter 2, Section 2.4.1 found that inventory control should be made easier and faster by using RFID technology. However, after analysis of the

qualitative data obtained during interviews from the inventory control librarians in Chapter 4, Section 4.11.7 it was found that at Unisa Library Services inventory control was not made easier and faster by the RFID technology. The main limiting factor is the RFID tag scanner that was needed to read the tags containing the information during inventory control. Several companies were approached but no RFID tag scanner that was tested proved effective.

Another contributing factor was the fact that RFID tags were not placed in library material in accordance with international standards. However, during testing of the mentioned tag scanners, not even all the tags placed in the correct position in the test books could be detected by the scanners.

Libraries need to ensure that sufficient testing of inventory control using RFID technology forms part of the investigation phase. This is especially important as inventory control is seen as an integral part of RFID services in libraries implementing RFID technology.

It is hence clear that faster and easier inventory control using RFID technology is not an advantage, as indicated in Chapter 2.

5.6 RFID EQUIPMENT USED ONLY BY LIBRARY STAFF

In Chapter 4, Section 4.12 the RFID equipment and certain aspects of the equipment that were used by library staff only were discussed. Such equipment includes the RFID staff workstation, conversion station and sorter machine.

5.6.1 Functionality of the multi-function RFID staff workstations used

The new RFID staff workstations that were obtained with the second tender have the ability to issue, return, desensitise, sensitise, write and edit the tags in the library material. The responses from the circulation librarians, delivery staff and shelving staff regarding the use of the different functions were analysed in Chapter 4 (see Table 4.51).

The majority of the circulation librarians used four types of functionality available on the staff workstations, namely, issuing, returning, sensitising and desensitising. The majority of the circulation librarians indicated they did not use it for writing or editing information

on the tags. It seems as if the circulation librarians who indicated that they did not use the staff workstations for desensitising and sensitising did not realise that the workstations automatically sensitise or desensitise the EM security strips depending on the LMS function chosen. That seems to indicate a lack of sufficient training in the use of the staff workstations.

All delivery staff used the issuing and returning functions but none of them indicated that they used the workstations for sensitising, desensitising, writing and editing. It seems as if the delivery staff who indicated that they did not use the staff workstations for desensitising and sensitising did not realise that the workstations automatically sensitise or desensitise the EM security strips depending on the LMS function chosen.

All shelving staff indicated that they did not use the staff workstations for any of the above six functions. They were using it in conjunction with the LMS for the sole purpose of counting of the number of books that were used in the library.

The reason that was given by the above-mentioned library staff sections for not using the staff workstations for writing and editing the information on the tags was that the task should be carried out by the acquisitions tagging staff.

Libraries need to ensure that all relevant staff receive the training needed to perform their duties. The training should be thorough enough to ensure that library staff are aware of all the possible functions of the staff workstations. The responsibilities of the different library staff sections need to be clarified by management and supervisors to prevent, for example, the perception mentioned by the other library sections that the writing and editing of tags is the sole responsibility of the acquisitions section.

5.6.2 Satisfaction with the use of the library staff RFID equipment

5.6.2.1 Satisfaction with the use of the RFID staff workstations

A Likert-type scale was used to analyse the information obtained from the relevant library sections. Analysis of the responses regarding satisfaction with using the staff workstations is tabulated in Chapter 4 (see Table 4.52). The majority of circulation librarians were neutral on their satisfaction with the staff workstations, while just more than 40% indicated that they were satisfied and just more than 8% indicated they were not satisfied.

The high neutral rating is an indication of respondents not experiencing a definite feeling of satisfaction or non-satisfaction.

Two-thirds of delivery staff did not feel satisfied with using the staff workstations. Analysis of delivery staff responses in Chapter 4 (see Table 4.62) regarding training received might be an indication of this phenomenon. One of the three staff members who did not receive training indicated that training would have been enabling in using the staff workstations. One of the two delivery staff who did receive training indicated that the training was not enabling. Hence, it seems that training was a deciding factor in the experience of satisfaction by delivery staff members.

Sixty per cent of the shelving staff were satisfied with using the staff workstation and 40% were neutral in this regard. The high neutral rating is an indication of respondents not experiencing a definite feeling of satisfaction or non-satisfaction.

One systems librarian rated satisfaction as 2 on the Likert scale and one rated it as 3 – neutral. Overall, therefore, systems librarians did not feel satisfied with the staff workstations while maintaining and supporting the equipment.

5.6.2.2 Satisfaction with the use of the RFID staff conversion stations

The analysis of the responses of the staff from the relevant library sections regarding satisfaction with the use of the staff conversion stations was done by using the Likert scale method. The results are available in Table 4.55, Chapter 4. 50% of the circulation librarians rated the use of the staff conversion stations as satisfactory, while nearly 38% indicated their satisfaction as neutral. This might be due to the training on the use of the conversion stations not being sufficient. This is confirmed in Table 4.65 where the majority indicated that they had not received training.

All (100%) of the acquisitions tagging staff rated their experiences while using the conversion stations as satisfactory, while one systems librarian rated the satisfaction with the conversion stations while maintaining and troubleshooting problems as neutral.

5.6.2.3 Satisfaction with the use of the RFID sorter machine

By using the Likert scale the responses from the shelving staff and systems librarians were analysed and tabulated in Table 4.58, Chapter 4. 70%, of the shelving staff

indicated that they were satisfied with the use of the sorter machine. Their high satisfaction can be attributed to the fact that in Figure 4.9, Chapter 4 they indicated that automatic sorting is faster and easier than manual sorting.

100% of systems librarians experienced the RFID sorter machine as satisfactory while maintaining and troubleshooting the machine.

5.6.2.3.1 Faster and easier sorting

In Figure 4.10, Chapter 4 the shelving staff's responses to the question about whether the sorter makes sorting easier and faster were analysed. 80% of the respondents indicated that shelving was indeed made easier and faster. They indicated that human error is reduced and apart from sorting books according to the relevant Muckleneuk library shelf level using the Dewey number and item locations, it is possible to sort books that belong to the other libraries into a separate bin.

5.6.3 Ease of use of the library staff RFID equipment

5.6.3.1 Ease of use of the RFID staff workstations

A Likert scale was used to analyse the responses of the library staff from the relevant sections. The results are tabulated in Chapter 4, Table 4.53.

Two-thirds of the circulation librarians indicated that the staff workstations were easy to use.

One-third of the delivery staff rated ease of use as very easy at 5 on the Likert scale, another third rated it as not easy – 2 on the Likert scale, none rated ease of use as not easy at all or 1 on the scale and one-third was neutral on ease of use. Taking the overall ratings into account, the majority of the delivery staff rated the use of the workstations as easy.

60% of the shelving staff rated use as easy and 40% was undecided. The high neutral rating is an indication of respondents not experiencing a definite feeling of satisfaction or non-satisfaction.

5.6.3.2 Ease of use of the RFID staff conversion stations

Analysis of the staff responses regarding the ease of use of the conversion stations was performed using a Likert scale. The results are available in Table 4.56, Chapter 4. Half of the circulation staff indicated that the use of the staff conversion stations was easy while 37.5% rated it as not easy. All acquisitions staff rated the use of the conversion stations as easy. Acquisitions staff are responsible for the tagging of library material on a daily basis, hence it would be easier for them to use the conversion stations than the circulation librarians who do not use the conversion stations often.

5.6.3.3 Ease of use of the RFID sorter machine

A Likert scale was used to analyse the responses of the shelving staff. The results are tabulated in Chapter 4, Table 4.59. All the shelving staff rated the use of the sorter machine as easy. Figure 4.10 in Chapter 4 confirms ease of use, with 80% of shelving staff indicating that the sorter machine makes sorting easier and faster.

5.6.4 Problems experienced while using the RFID staff equipment

5.6.4.1 Problems experienced with the RFID staff workstations

The results of the analysis of the library staff's responses are tabulated in Chapter 4, Table 4.54.

5.6.4.1.1 Problems experienced by circulation librarians using the RFID staff workstations

The majority – nearly 46% of circulation librarians experienced problems while using the staff workstations. This is in line with the majority of respondents who rated satisfaction while using the workstations as neutral (Chapter 4, Table 4.52). The respondents indicated a high rating for ease of use even though the satisfaction was neutral (Chapter 4, Table 4.53). On the other hand, one-third of respondents indicated that they did not experience problems while using the staff workstations. In the qualitative part of their responses circulation librarians indicated that the RFID staff workstations did sometimes not read the RFID tags in items. This is due to the problems already discussed regarding the quality of the tagging process in Section 5.4.1.2.

5.6.4.1.2 Problems experienced by delivery staff using the RFID staff workstations

Two-thirds of the delivery staff did not experience problems with the staff workstations. The majority also indicated that the workstations are easy to use (Chapter 4, Table 4.53). The one-third that did experience problems commented that these were mainly hardware and software problems. In some cases, the information from the tags would be read correctly by the staff workstations but would not necessarily be displayed correctly in the LMS. The latter is an example of a RFID staff workstation software problem experienced.

5.6.4.1.3 Problems experienced by shelving staff using the RFID staff workstations

Analysis showed that the majority – 80% of shelving staff, experienced problems. This was the case even though the majority rated satisfaction (Chapter 4, Table 4.52) and ease of use (Chapter 4, Table 4.53) as high and all the respondents had received training (Chapter 4, Table 4.63) and felt enabled. They indicated in their comments that the staff workstation they were using did not always read more than one item tag successfully. They also experienced problems with the staff workstation not always reading the tags successfully into the LMS, although the tags and the information on the tags were correct. The position of the staff workstation on the desk was also highlighted as a problem.

5.6.4.1.4 Problems experienced by the systems librarians with the RFID staff workstations

Both the systems librarians indicated that they experienced problems which correspond with their low satisfaction rating (Chapter 4, Table 4.52). These respondents were responsible for maintenance and support of the staff workstations and their integration with the LMS.

5.6.4.2 Problems experienced with the RFID staff conversion stations

The responses of library staff were analysed and tabulated in Chapter 4, Table 4.57.

5.6.4.2.1 Problems experienced by the circulation librarians with the RFID staff conversion stations

A majority of 75% of the circulation librarians that had access to conversion stations did not experience problems with the conversion stations. This is in contrast with the low satisfaction (Chapter 4, Table 4.55) rating. However, it corresponds with the majority of respondents rating ease of use as high (Chapter 4, Table 4.56); on the other hand, 12.5% of these respondents experienced problems while 12.5% did not answer the question.

5.6.4.2.2 Problems experienced by the acquisitions staff with the RFID staff conversion stations

All acquisitions staff respondents experienced problems using the RFID conversion stations. This is in contrast with the predominantly satisfied rating (Chapter 4, Table 4.55) and easy to use rating (Chapter 4, Table 4.56) that acquisitions tagging staff gave the conversion stations. The respondents indicated that it was mostly hardware problems. Staff also had to be careful that the items of which the information that were waiting to be written onto the tags were not put too close to the conversion station as this led to errors in the data written onto the tags.

5.6.4.2.3 Problems experienced by the systems librarians with the RFID staff conversion stations

One (50%) of the systems librarians indicated that problems were experienced with the conversion stations. It must be noted that the one respondent was neutral on the satisfaction with the conversion stations (Chapter 4, Table 4.55). The problems that were experienced were indicated as being hardware and software problems. One respondent (50%) did not answer the question as he/she was not involved in the maintenance and support of the conversion stations.

5.6.4.3 Problems experienced with the RFID sorter machine

Analyses of the problems experienced by shelving staff and systems librarians are tabulated in Chapter 4, Table 4.60.

5.6.4.3.1 Problems experienced by the shelving staff and systems librarians with the RFID sorter machine

40% of shelving staff experienced problems with the sorter machine while 60% did not. This confirms the high satisfaction and ease of use rating for shelving staff respondents. However, both systems librarians indicated that problems were experienced with the sorter machine. Shelving staff commented that most problems experienced were related to hardware, software and network issues. In addition, the sorter machine did not always sort items correctly due to incorrect information on the tags. In some cases, items could not be sorted because tags were missing or information on tags was incorrect. This was as a result of the problems already discussed in relation to the quality of the tagging process in Section 5.4.1.2.

From the above sections regarding problems experienced, it is clear that library staff often experienced problems with the RFID equipment meant for use by library staff, with the majority of library staff experiencing such problems. Only in the case of delivery staff using the RFID staff workstations, circulation librarians using the conversion stations and the shelving staff using the sorter machine did the minority experience problems. In most cases it was also found that the satisfaction rating and ease of use rating did not correspond with the percentage of staff who experienced problems.

The more problems library staff experience with the RFID staff equipment the greater the effect they will have on the performance of their daily tasks. In cases where staff experience many problems there is always the danger that their attitude might be negatively affected. Library staff with a negative attitude might also be inclined to influence the users of the RFID self-help circulation services negatively.

5.6.5 Training in the use of the RFID equipment used only by library staff

5.6.5.1 Training of circulation librarians in the use of the RFID staff workstations

Analysis of the circulation librarians' responses in Chapter 4, Table 4.61 shows that nearly 88% of the circulation librarians had received training in the use of the RFID staff workstations, while 12.5% indicated that they had not. Close to 81% of the circulation librarians that had received training indicated that the training had enabled them while

close to 10% felt that the training had not. Two-thirds of the respondents that had not received training indicated that training would have enabled them to use the staff workstations better. The reasons given by staff who felt that the training had not enabled them were that the staff workstations were often defective. These staff therefore felt that, owing to technical problems with the staff workstations, the training could not be applied successfully. One circulation librarian had received training but did not use the staff workstations while performing daily duties.

5.6.5.2 Training of delivery staff in the use of the RFID staff workstations

Delivery staff's responses were analysed in Chapter 4, Table 4.62. Two-thirds of the delivery staff had received training in the use of the staff workstations while a third had not. 50% of the staff who had received training felt enabled, while the other 50% did not feel enabled. Figure 4.8, Chapter 4 might explain this. A third of the respondents felt that using the RFID staff workstations was not a better method than scanning barcodes during the issue and return of library material. The same delivery staff member also indicated in the qualitative comments that although training had been received, using RFID tags was not better than using barcodes. Hence this staff member did not feel enabled by the RFID training which focused on the use of RFID tags and hence applying the RFID training was not seen as enabling. The respondent who had not received training indicated that training would have been enabling in the use of the staff workstations.

5.6.5.3 Training of shelving staff in the use of the RFID staff workstations

Shelving staff's responses were analysed in Chapter 4, Table 4.63. All (100%) of the shelving staff respondents had received training in the use of the RFID staff workstations and all indicated that the training had enabled them to use the staff workstations.

5.6.5.4 Training of acquisitions tagging staff in the use of the RFID conversion stations

Analysis of the responses of acquisitions staff in Chapter 4, Table 4.64 shows that 75% of the acquisitions staff had received training in the use of the RFID conversion stations used solely for writing and editing information on the RFID tags. All the respondents

who had received training indicated that the staff conversion station training enabled them.

5.6.5.5 Training of circulation librarians in the use of the RFID conversion stations

Circulation librarians' responses were analysed in Chapter 4, Table 4.65. The analysis shows that the majority, nearly 17%, of circulation librarians did not receive training in the use of the conversion stations while only 12.5% had received training. All the respondents that had received training indicated that the training enabled them to use the conversion stations. 50% of the respondents who had not received training indicated that the training would have enabled them and 50% indicated that they would not have been enabled if they had received training. In addition, 62.5% of the respondents indicated that they did not receive training in the use of the conversion stations as the libraries where they were based did not receive any RFID conversion stations.

5.6.5.6 Training of shelving staff and systems librarians in the use of the sorter machine

Analysis of the responses of the shelving staff and the systems librarians are tabulated in Chapter 4, Tables 4.66 and 4.67 respectively. All shelving staff had received training in the use of the RFID sorter machine and all indicated that the training had enabled them to use the sorter machine. The same is true for the two systems librarians.

From the above sections regarding training it is clear that the majority of library staff who had received training in the use of the RFID equipment felt that the training had enabled them in the use of the equipment. The majority of staff who had not received training indicated that training would have enabled them in using the equipment. Libraries therefore have to ensure that structured training is part of the implementation project.

5.7 CONCLUSION

The data that was analysed in Chapter 4 was further interpreted, discussed and certain recommendations were already made in this chapter, Chapter 5. The following chapter will consist of a summary of the study and will continue to make a number of recommendations.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS ARISING FROM THE STUDY

6.1 INTRODUCTION

In the previous chapter the findings were further interpreted and discussed. Indicators of factors, best practice and advantages and disadvantages that influence the implementation and use of RFID self-help circulation services were discussed. The results regarding the factors, best practice, advantages, and disadvantages were also interpreted and further discussed.

Chapter 6 focuses on a summary of the study, as well as the conclusions drawn on the basis of the findings. It also includes recommendations. The conclusions and recommendations will answer the research questions that were formulated at the beginning of the study and the objectives derived from the questions.

The objectives that the study aimed to achieve as indicated in Chapter 1, Section 1.3 are the following:

- Identify the factors that have an influence on the effectiveness of RFID self-help circulation services in academic libraries (with the focus on Unisa).
- Identify best practice for the implementation of RFID self-help circulation services in academic libraries (with the focus on Unisa).
- Identify the advantages and disadvantages of implementing RFID self-help circulation services in academic libraries (with the focus on Unisa).
- Compile recommendations to be considered before a library decides to implement RFID self-help circulation services.

6.2 SUMMARY OF THE STUDY

The aim of the study was to establish the factors, best practice, advantages and disadvantages that influence the use of RFID self-help circulation services for service

delivery by South African academic libraries with specific emphasis on Unisa Library Services. This was achieved by firstly conducting a literature study to identify the factors, advantages and disadvantages and best practice pertaining to RFID self-help circulation services. Questionnaires, interviews and existing statistical document analysis were used to collect information pertaining to the factors, advantages and disadvantages and best practice that influence the use of RFID self-help circulation services by academic libraries.

The study focused on Unisa Library Services as the only academic library service in South Africa that has implemented a fully-fledged RFID self-help circulation services solution. It was therefore assumed that unique conclusions and recommendations could be made by obtaining information from the Unisa user population.

6.3 CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations were made based on the findings.

6.3.1 Factors, best practice, advantages and disadvantages that influence the use and implementation of RFID self-help circulation services

6.3.1.1 Indicators of possible factors, best practice, advantages and disadvantages

In Chapter 5, Section 5.2 a number of indicators were identified that point to the presence of certain factors, best practice, advantages and disadvantages that influence the use of RFID self-help circulation services in academic libraries. The first of these main indicators was the fact that the increase from manual loan desk circulation to RFID self-help circulation services statistics does not change significantly over the years. Another indicator was the fact that the majority of the student respondents did not use the RFID self-issue or self-return services. The frequency of use of the self-help services is also an indicator; student respondents who did indicate that they used the self-help services also used the self-issue and self-return services more often than staff users and staff who were also students.

Satisfaction with the use of the self-help services is another indicator of the presence of factors, best practice, advantages and disadvantages that influence the use of RFID self-help circulation services. This is indicated by the fact that all three library user categories indicated a high percentage of satisfaction. The findings regarding the

satisfaction of library staff with the use of self-help circulation services indicated that the majority were satisfied. Ease of use of self-help circulation services is another indicator. The high percentage of library users and library staff who rated use of these services as easy is also an indication of factors, best practice and advantages and disadvantages that influence the use of RFID self-help circulation services.

6.3.1.2 Best practice that influences the use of RFID self-help circulation services

The first best practice that was highlighted in Section 5.3 of Chapter 5 was the use of a feasibility study to obtain information on the different RFID self-help circulation systems. Information also needs to be obtained from academic institutions where RFID technology has already been implemented. The feasibility of using an RFID system needs to be investigated within the context of the type of user to whom library services are delivered. In Unisa's case, the majority of users are ODeL users. The study found that many respondents do not make use of the Unisa Library Services' on campus circulation services, while others only make use of the online electronic library resources and still others indicated that they borrow library material using the online library catalogue and the postal and courier services of Unisa Library Services. The type of RFID self-help circulation functionality also needs to be considered, as the needs of the library and its user corps will decide which functionality will be chosen. Lastly, it is very important to ensure that the chosen functionality is tested to guard against choosing a functionality that does not meet the needs of the library. Well drawn-up specifications should ensure that the functionality that is needed will be obtained.

Libraries should ensure that best practice regarding the implementation project itself is adhered to. All parties involved must agree on the responsibility for the RFID self-help circulation services' implementation project. In the Unisa Library Services' case, the companies that were awarded the first and second tenders supplied the main project management. Tender specifications must clearly stipulate what is expected of the project manager and proof of project management experience should be supplied. However, it is also important to have a secondary project manager and/or project management team from the library to monitor the project. As the project progresses, relevant staff from different sections of the library, or even the academic institution, with expert knowledge of specific processes should also be involved in the project. One

example is the institution's ICT department, which should be involved in decision-making and giving assistance in ICT-related issues. A clear project plan with specific timelines and responsibilities should also be created.

From the research results it was clear that structured change management in the form of a marketing campaign targeting institutional staff and library users is crucial. These parties need to be made aware of the planned introduction of the RFID technology using email, meetings, web marketing, institutional intranet, posters on the campuses and in the libraries, and so forth. Library staff should be empowered to make library users aware of the new technology and its advantages. Hence, training is extremely important to enable staff to do this.

During the planning phase, it is crucial to ensure that any changes to the structure of the building should be catered for. A separate room or a specially built enclosure for the book return machine must be provided. There should be enough space for the RFID sorter machine and library staff to move the bins to and from the sorter machine. Ignoring space requirements will delay the implementation project and might even lead to RFID equipment not being utilised as intended.

Another best practice that will influence the use of the RFID self-help circulation services is the ability of circulation staff to monitor the use of the self-help machines. Libraries need to ensure that the machines are placed where circulation staff can monitor them and assist users easily. This is easier to achieve with the self-issue machines than with the self-return machines. If the self-return machines are placed where library users may access them after hours, monitoring during office hours will be difficult as they will be placed outside the library and in many cases far from any assisting staff.

It is important that standards pertaining to RFID technology are adhered to. All academic institutions must adhere to financial regulations and hence, tags might be purchased from different vendors, which make standardisation crucial. Libraries need to ensure that the RFID self-help circulation system chosen adheres to these standards as this will ensure that any vendor's RFID system will be compatible with any other vendor's RFID tags. The different RFID systems also need to be standardised to make the use of the different self-help systems seamless for library users. This is especially

important where financial regulations have necessitated the implementation of two different RFID systems, as in the case of Unisa Library Services. It is highly unlikely that the procedures on the different RFID systems' equipment will be the same but the underlying technology must adhere to the relevant RFID standards to ensure that the user experience will be broadly the same no matter which RFID self-help circulation system is used.

Ensuring that the RFID self-help circulation system and the LMS are integrated is crucial. A very important protocol, SIP2, determines the level of integration. If certain functionality is available on the self-help circulation system and not on the LMS or vice versa, the functionality will not be available to users. An example of non-integration of the LMS and the self-help circulation system in the Unisa study are the inability of more than one book to be self-issued simultaneously as all books might be desensitised without ensuring that all books are also issued on the LMS. Another example is that during the self-return of books it was found that not all books were in all cases also returned on the LMS resulting in incorrect fines being generated. Only the "On hold" status can be identified during the RFID sorting process. Identifying items that are on hold by using a RFID sorter is another of the objectives identified by Unisa library senior management. The biggest problem that was encountered due to non-integration was the fact that RFID inventory control was not possible as no tag scanner could be found that could detect all books with tags on the shelves. Sadly, RFID inventory control was one of the main objectives of the RFID technology implementation at Unisa Library Services.

The objective of delivering an improved service to library users by enabling them to assist themselves through enhancing the accuracy of issuing and returning books and by providing library processes that are more seamless was not fully achieved. The above-mentioned lack of integration of the LMS and the RFID self-help circulation system is proof of this.

Another best practice is to put measures in place to ensure that library users are encouraged to use the RFID self-help circulation services rather than the manual loan desk as far as possible. Users can be encouraged to use the self-help circulation services by making them aware of the advantages of the services. Marketing the RFID self-help circulation services effectively to library users and targeting library users with

training in the use of the self-help circulation services are very important. It is also crucial that circulation staff have a clear mandate from library management to actively encourage library users to use the RFID self-help circulation services.

6.3.1.3 Factors that influence the use of RFID self-help circulation services

Tagging of library material items is crucial to the implementation of RFID self-help circulation services. RFID tags in library items form the core of the RFID self-help circulation services. If the RFID company is made responsible for tagging or the library staff or even temporary workers or combinations of the afore-mentioned, it is crucial that the tagging project should be structured and all stakeholders should be involved to ensure effective and timeous completion.

Decisions need to be made regarding the type of information that should be included on the tags to enable the RFID self-help circulation equipment and the LMS to identify the specific item. The recommended type of information to be included on the tags is listed in Chapter 5, Section 5.4.1.1. Tagging standards also need to be adhered to especially regarding the placement of the tags in the library items. The correct placement of tags will be a deciding factor in the effective reading of the tags during the use of the RFID self-help circulation equipment and library staff RFID equipment. A further factor that will influence the use of the RFID self-help circulation services will be the quality of the tagging process itself. It is crucial that quality control be part of the tagging process.

The original RFID implementation project started in 2010 and was completed in 2011. The project included bulk tagging of the Unisa Library Services' library material. A second implementation project with additional RFID self-help equipment was started in 2013 and completed in 2014. In Chapter 5, Section 5.4.1.2 it was shown that a substantial number of library material items was still found with tag-related problems as late as January to December 2015. This is also contributing to the fact that the objective of delivering an improved service to library users and by providing library processes that are more seamless was not fully achieved. If too many library material items are found with tag problems, it will lead to a delay in the correction of the problem and the availability of the item for loan. Libraries should plan to handle tagging problems quickly and efficiently. One way of speeding up the handling of tagging problems is to give circulation librarians, shelving staff, delivery staff and inventory control staff access to

RFID staff workstations that can be used to edit or write information on the tags, together with a clear management directive that these staff should use it for this purpose. As in the case of Unisa Library Services, correcting of tagging problems that are found with library material, should not be the responsibility of just one section, for example the acquisitions section.

The same principles are valid for library material items found with tags removed or damaged. This hints at another important factor that was identified which was the fact that some library users appear to think that security features are built into the tags to secure the items against theft. To prevent or limit this from happening it is crucial to make library users and staff aware that the RFID tag is not used for securing the items. Hence, it is also important that libraries decide whether they will use the tags for security purposes or not by weighing up the pros and cons mentioned in Chapter 2, Section 2.4.2.

As already mentioned, training of library staff and users is of the utmost importance. The initial training of library staff should take the form of structured training presented by the RFID company and an accredited trainer. The training should also be of such a high quality that the library staff who receive the training will be empowered to train library users and any new staff members.

Training is so crucial that the absence of training will affect the use of the RFID self-help circulation services, as indicated in Chapter 5, Section 5.4.2. However, many respondents, especially students who did not receive training, indicated that it would not have enabled them to use the RFID self-help circulation services. The reasons for this, as were identified in the Unisa study, also highlighted further factors that may influence the use of RFID self-help circulation services. Libraries need to consider the fact that some potential users will not use the library services at all. Other users, for example certain groups of students, will not need to issue books to themselves as they do not need them for their studies because the prescribed books and course material are sufficient. Some users will only use the books in the library and many other users only use the library for study purposes. Owing to their distance from campus libraries, some users will only use books that are issued and posted or couriered to them. In addition, many users, especially postgraduate students, only need to use the online library e-

resources. These factors have to be considered when planning the implementation of RFID self-help circulation services, as highlighted in Chapter 5, Section 5.4.2.2.

Another factor to consider is the ease of use of the RFID self-help services. In Chapter 5, Section 5.4.2.2 it is found that a high percentage of library users did not receive training but nevertheless used the RFID self-help circulation services, thus indicating that many users find the self-help services easy enough to use. Circulation staff need to take note of this, but as these users were not in the majority training aimed at the majority of users is still important. Ease of use is confirmation that the objective of delivering an improved service to library users by enabling them to assist themselves has been partially achieved.

From the research results, certain problems were identified that might influence RFID self-help circulation services. The one problem that stood out was the “Machine was not working” problem. In this problem category either the difference between library users and staff who did not experience the problem and those that did was not that huge or a smaller majority experienced the problem. Therefore, it seems that technical problems were the most prevalent type of problem experienced. In all the other problem categories, the far greater majority of users did not experience problems. In Tables 4.5 to 4.7, the high rate of satisfaction of library users and library staff with the use of the RFID self-help circulation services confirms this trend. However, libraries still need to ensure that the recommended steps as discussed in Chapter 5, Section 5.4.3 are taken to limit the occurrence of the other problems.

If a library has two different RFID self-help circulation systems it can be expected that there will be differences in functionality. To cater for these differences, it is necessary to ensure that the on-screen instructions on the self-help machines are clear and easy to follow. These instructions can be supplemented by further instructions on posters next to the machines to provide further clarity if necessary. Training is also crucial to accommodate any differences in functionality between the two RFID self-help circulation services and also the RFID staff equipment. Libraries should also ensure that they make provision for the possible difference in problem reporting procedures to different RFID support companies.

In the Unisa study, the majority of users indicated that the RFID self-help circulation services were placed where they were accessible. This is an indication of partial achievement of the objective of delivering an improved service to library users by enabling them to assist themselves. Libraries need to place RFID self-help circulation services where they are visible to users and are not obstructed in any way. With self-return services, it is the best to place the machines at the entrance to the library so that users do not have to enter the library to only return books.

If a library allows books to be returned at any of the institution's branch libraries, there is an important factor to consider. Each branch library should have a way to identify the library to which a book returned via the self-return unit belongs. If there is no owner stamp or indication on the outside of the book, for example the owner library's name as a prefix on the spine label, library staff will have to check each book on the LMS to determine the owner. If this is not done, books will not be returned to the owner library. Hence, implementation of RFID self-help circulation services actually contributes to duplication of the circulation return function.

During the literature study, it was found that in many international libraries users' privacy concerns when using RFID self-help circulation services were an important issue. During the Unisa study it was found that just less than 40% of respondents indicated that they had privacy concerns in this regard. In South Africa, the Protection of Personal Information Act No. 4 of 2013 (POPI Act) provides protection for the privacy of personal information. Libraries need to ensure that library users' personal information is protected while they are using the self-issue services. This can be achieved by using a PIN together with the user identification card during authentication. The PIN adds a second authentication layer making unauthorised access or interception of the patron's details on the LMS difficult. Marketing and training regarding the use of the self-issue services and user privacy will also be valuable.

Possible changes in library staff roles or responsibilities were highlighted as a factor that needs to be considered when deciding to implement a RFID self-help circulation services system (see Chapter 2, Section 2.3). Implementation of a RFID system led to changes in the roles or responsibilities of Unisa Library Services' circulation librarians. After implementation of the RFID self-help circulation system in 2010, circulation

librarians became more involved in training and instructing library users in fulfilling their specialised information needs.

One of the objectives identified by Unisa library senior management for implementing RFID self-help circulation services was to make circulation librarians available for fulfilling the specialist information needs of Unisa students (see Chapter 4, Section 4.8). This objective was attained to a certain degree as the majority of the librarians indicated that their daily tasks moved from predominantly circulation functions to assisting and training of library users in retrieving specialised information (see Chapter 4, Figure 4.6).

6.3.1.4 Advantages and disadvantages of using RFID self-help circulation services

It is crucial that users save time during the use of the RFID self-help circulation services as opposed to the use of the manual loan desk. If time is saved, fewer circulation librarians are necessary to circulate library material manually. More emphasis on assisting and training of library users in the specialised library services by circulation librarians is also one of the objectives identified by Unisa library senior management (see Chapter 4, Section 4.8). This should be possible if library users are encouraged to use the self-help circulation services thus allowing staff to do more specialised tasks such as assisting library users with accessing e-resources.

In the Unisa study, it was found that the majority of respondents indicated they saved time by using the RFID self-help circulation services. This confirmed what was established during the literature study. However, to ensure that users do indeed save time, problems with the self-help services must be limited. In the Unisa study it was found that the majority of library user respondents indicated that they did not experience many problems using the RFID self-help circulation services. However, a smaller majority indicated that they did not experience many problems with the problem category “Machine was not working”. Technical problems should therefore be limited by having a maintenance contract in place with the RFID support company. The contract should stipulate reasonable turn-around times for the company to resolve technical problems.

By using RFID tags instead of barcodes during circulation, the current study found that circulation was easier. The Unisa study confirmed the finding in the literature study that

this is definitely an advantage that should be considered when deciding whether to use RFID technology. This is confirmation of partially achieving the objective of delivering an improved service to library users by enabling them to assist themselves and by providing library processes that are more seamless.

During the Unisa study it was found that the renewal of books is not possible due to a limitation in the LMS SIP2. Hence this is not an advantage. Libraries need to ensure that this is considered during the decision-making process.

The self-issue and return of audio-visual material was not found to be an advantage during the Unisa study and that it was unfeasible due to the nature of the RFID self-help services technology and the audio-visual equipment. This is confirmation of not fully achieving the objective of delivering an improved service to library users by enabling them to assist themselves and by providing library processes that are more seamless. The electro-magnetic field of the self-issue machine's desensitising unit can damage the information on the media and audio-visual material can be physically damaged when it is returned via the self-return machine. Libraries should ensure that instructions with the self-help machines are clear to prevent users from issuing or returning such material via the self-help services. Training for staff and users must include this restriction.

Simultaneous self-issuing of more than one book at a time using the RFID self-help circulation services was found to be an advantage during the literature study. During the Unisa study it became clear that this was not so at Unisa Library Services because a SIP2 limitation prevented more than one book from being self-issued simultaneously. It was found that during simultaneous self-issuing of more than one book, all books would be desensitised but not all books would be issued on the LMS. This is confirmation of not fully achieving the objective of delivering an improved service to library users by enabling them to assist themselves and by providing library processes that are more seamless. Libraries need to test RFID systems for this limitation as this might change as the technology develops. If this is still a limitation when a library decides to implement a RFID self-help circulation system, training regarding this limitation is crucial and libraries should also ensure that the on-screen instructions are clear enough to highlight this limitation.

During the Unisa study it was found that books could be desensitised automatically while using the RFID circulation self-issue services. Owing to a technical limitation, however, it was found that it was not possible to sensitise books automatically when using the self-return service. This is confirmation of not fully achieving the objective of delivering an improved service to library users by enabling them to assist themselves and by providing library processes that are more seamless. Again, training is crucial for staff in particular to make them aware of this ability on self-issue and the limitation on self-return.

During the literature study, it was found that inventory control using RFID technology was seen as an advantage and should make inventory control easier, faster and more efficient. However, during the Unisa study it was found that RFID inventory control was not successful. The main problem was the availability of a tag reader that could read the tags in library material items on the shelves successfully. The wrong placement of the tags in the items also contributed to unsuccessful implementation of RFID inventory control. Unisa library senior management identified RFID inventory control as an objective of implementing RFID technology (see Chapter 4, Section 4.8). If inventory control is identified as one of the main objectives for implementing a RFID system, libraries need to test the RFID inventory technology thoroughly beforehand.

6.3.1.5 RFID equipment for use by library staff

As part of the RFID system implementation certain equipment can also be obtained for staff use only. RFID staff workstations can be used to not only enable circulation staff to circulate library material items at the manual circulation desk but also to write information to RFID tags. Hence, when a tag is damaged or there is no tag in the item or the information on the tag is incorrect, circulation staff and even staff from other sections who encounter these types of tag problems can be enabled to handle the problem themselves. Libraries need to ensure that the RFID staff workstations will have the necessary functionality by including it in the technical specifications. Libraries also need to decide whether items with tag problems will be corrected by a central section or by each section itself thus preventing users from having to wait too long for an item.

In Chapter 5, Section 5.6.2 it is shown that the satisfaction of library staff with the use of the RFID staff equipment differed from a high percentage of satisfaction in using the

sorter machine, to a low percentage using the staff workstations and the tag conversion stations. This seems to emphasise the importance of training as quite a high percentage of staff was neutral regarding satisfaction. Library management and supervisors also need to monitor the use and any problems encountered that might affect satisfaction. This then needs to be reported to the systems librarians so it can be resolved as soon as possible.

The ease of use of the RFID staff equipment was in general higher than the satisfaction rate. This seems to indicate that the lower satisfaction rate might also be partly due to user resistance, which in turn might stem from the previously mentioned uncertainty regarding the purpose for which the RFID staff workstations should be used, for example for tagging purposes as well.

In the case of the use of the RFID sorter, 80% of shelving staff found that sorting of books were made easier and faster (see Chapter 5, Section 5.6.2.3.1). This is also confirmed by a 70% satisfaction rate while using the sorter. This is one of the objectives of Unisa library senior management that was attained by implementing RFID technology.

The majority of staff indicated that they had received training in the use of the RFID staff equipment and the majority of the staff who had received training felt enabled by the training. The majority of staff who had not received training also indicated that they felt training would have enabled them to use the staff equipment. The exception is the delivery staff of which 50% of the staff who received training did not feel enabled in using the equipment. This might indicate a lack of efficient training but user resistance might also have been a factor. From Chapter 5, Section 5.3.3 it is also clear that change management might have played a role. Although the majority of all library staff had experienced change management, low percentages of library staff from each section indicated that they had experienced this. A lack of change management will lead to a higher occurrence of user resistance towards new technology. Hence, libraries need to focus on efficient training of library staff and also ensure that change management reaches all staff.

6.4 FURTHER RESEARCH

Possible further research might be a comparative study of academic libraries that have implemented RFID self-help circulation services and those libraries that have implemented only self-help circulation services and not fully-fledged RFID self-help circulation services. More comprehensive research may also be conducted into how the increasing emphasis on e-resources such as electronic articles and e-books influences the use of RFID self-help circulation services in academic libraries. As the focus of academic libraries in particular moves towards e-resources, RFID self-help circulation services might be used less because less printed library material might be in use. The opposite is also true – less use of printed library material might justify the use of RFID self-help circulation services, the argument being that the users that still use printed material can rather use the RFID self-help circulation services. Circulation staff could then rather be used for other specialised library services. However, the cost of RFID self-help circulation services will be a deciding factor. Further research could also be done on the use of RFID tags for securing books against theft. In addition, inventory control using RFID technology could also be researched, as it seems to be a field that is still under development.

6.5 CONCLUSION

This chapter gave a summary of the study. The recommendations and conclusions were discussed by keeping in mind the objectives of the study. It is concluded that the objectives that were set for the study were achieved. Recommendations were made based on the best practice and factors and advantages and disadvantages that were identified during the study. These recommendations could serve as a guideline to South African academic libraries if they decide to investigate the implementation of a RFID self-help circulation services system.

Unisa Library Services' senior management identified certain objectives they felt will be achieved by implementing the RFID self-help circulation services. The degree to which the listed objectives were achieved was also indicated in this chapter. Most objectives were partially obtained except for the objective of successful RFID inventory control which was not obtained at all. Lastly, further possible research regarding RFID self-help circulation services systems was highlighted.

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ANNEXURE 1

QUESTIONNAIRES

Use of RFID self-help services on campus for issuing and returning books- library users

http://survey.unisa.ac.za/index.php/264894/lang-en

Dear Unisa student or staff member,

I am a Unisa student and staff member busy with research for my MA Information Science dissertation. The dissertation topic is “The use of Radio Frequency Identification self-help circulation services for the delivery of user services at the University of South Africa Library Services”.

RFID self-help circulation services and equipment are available for use by Unisa students and staff to enable self-issue (check out) and self-return (check in) of library books on campuses of Unisa. The purpose of the research will be to establish which factors and best practice influence Radio Frequency Identification (RFID) self-help circulation services in South African academic libraries and what the advantages and disadvantages are of RFID by focusing on the Unisa Library Services.

As Unisa staff member or student your valued input is crucial for this research to be relevant and successful. The findings will also assist Unisa Library Services to deliver an even more improved service to Unisa users. The survey should not take longer than 15-20 minutes to complete. Participation is completely voluntary. All participants will be treated as anonymous. Anonymity will be maintained by ensuring that it will not be possible to identify participants through the information they supply. All information supplied will be treated as confidential. Please take note that this research is bound by the “Unisa Policy on Research Ethics”. Ethical clearance for the research was obtained from the Senate Research Innovation and Higher Degrees Committee (SRIHC). By continuing with the completion of the survey, you give your consent and for the results to be used for research purposes only.

Thanks

Francois Keyser (Systems Librarian: Unisa Library)

There are 34 questions in this survey

Acceptance

1 Please accept participation in the survey by choosing the appropriate option: *

Please select at most one answer:

☐ Yes, I accept to participate in the survey

☐ No, I do not accept to participate in the survey (if No, please exit the survey)

Section A: Preliminary information

2 Gender:

Please select at most one answer:

☐ Male

☐ Female

3 **Age group:** *

Please select at most one answer:

☐ under 20

☐ 20-29

☐ 30-39

☐ 40-49

☐ 50-59

☐ 60-69

☐ 70+

4 **Are you a Unisa student or staff member or both?** *

Please select at most one answer:

☐ Student

☐ Staff member

☐ Student and staff member

5 **Highest qualification obtained eg. Matric, Bachelor of Science, B Sc.***

Please write your answer here:

6 **Name of qualification you are currently studying towards. If you are a Unisa staff member and not also a Unisa student, please skip this question:**

Please write your answer here:

7 College that is presenting the qualification. If you are a Unisa staff member and not also a Unisa student, please skip this question:

Please select at most one answer:

- ☐ College of Accounting Sciences
- ☐ College of Agriculture and Environmental Sciences
- ☐ College of Economic and Management Sciences
- ☐ College of Education
- ☐ College of Human Sciences
- ☐ College of Law
- ☐ College of Science Engineering and Technology

8 If you are a Unisa staff member, please indicate the appropriate staff category:

Please select at most one answer:

- ☐ Instructional/research professional
- ☐ Executive/management professional
- ☐ Specialised/support professional
- ☐ Technical
- ☐ Non-professional admin
- ☐ Crafts/trades
- ☐ Service workers

Section B: Using the self-help machines to ISSUE library material

9 **Which Unisa campus do you visit most often?***

Please select at most one answer:

- ☐ Cape Town
- ☐ East London
- ☐ Durban
- ☐ Nelspruit
- ☐ Polokwane
- ☐ Rustenburg
- ☐ Florida
- ☐ Johannesburg
- ☐ Pretoria (Muckleneuk)
- ☐ Sunnyside
- ☐ None

10 **Do you use the self-help machines to *ISSUE* library material to yourself?***

Please choose **only one** of the following:

- ☐ Yes
- ☐ No (if No, please list any reason/s in the comment box)

Please enter your comment here:

11 **If you answered Yes on question 10, please indicate how often you use the self-help machines to *ISSUE* library material. If your answer on question 10 was**

No, please continue through the questions and only answer the ones marked with * while still following the instructions where applicable.

Please select at most one answer:

- [ ] Once a week
- [ ] More than once a week
- [ ] Once a month
- [ ] More than once a month
- [ ] Once every 3 months
- [ ] Once every 6 months
- [ ] Once every 9 months
- [ ] Once a year
- [ ] Other: [ ]

12 **Please rate your overall satisfaction with using the self-help machines for *ISSUING* library material on the below scale- 1 being "Not satisfied at all" and 5 "Very satisfied".**

Please choose the appropriate option:

- [ ] 1
- [ ] 2
- [ ] 3
- [ ] 4
- [ ] 5

13 **Please rate the ease of using the self-help machines for *ISSUING* library material on the below scale- 1 being "Not easy at all" and 5 "Very easy".**

Please choose the appropriate option:

☐ 1

☐ 2

☐ 3

☐ 4

☐ 5

14 **Do you feel that the self-help machines for *ISSUING* library material saved you time while *ISSUING* library material?**

Please choose **only one** of the following:

☐ Yes

☐ No (If No, please list any reason/s in the comment box)

Please enter your comment here:

15 **If you encountered problems with using the self-help machines for *ISSUING* library material, please indicate what type of problems you encountered.**

Please choose **all** that apply:

☐ The machine was not working (out of order)

☐ The machine could not read your university identification card

☐ The machine did not accept your PIN

☐ The machine indicated that the library material could not be issued due to a problem with the library material

☐ The machine indicated there is a problem with your library account

☐ The machine did not print a due date slip

☐ The security gates/turnstiles did not allow you through after issuing the library material

☐ Other:

16 **Were the self-help machines for *ISSUING* library material easily accessible ie. placed conveniently so that you could *ISSUE* library material without any hinderance? Please indicate on the below scale- 1 being "Not accessible at all" and 5 "Very accessible".**

Please choose the appropriate choice:

☐ 1

☐ 2

☐ 3

☐ 4

☐ 5

17 ***Did you receive training by Library staff in the use of the self-help machines for *ISSUING* library material?**

Please select at most one answer:

☐ Yes

☐ No

18 ***Did the training assist you in using the self-help machines for *ISSUING* library material? If your answer on question 17 was No, please skip this question.**

Please choose **only one** of the following:

☐ Yes

☐ No (if No, please list any reason/s in the comment box)

Please enter your comment here:

19 ***If you did not receive training, do you feel that training would have assisted you in the better use of the self-help machines for *ISSUING* library material? Only answer this question if your answer on question 17 was No.**

Please select at most one answer

☐ Yes

☐ No

20 **Did you feel at any time that any of your private information might have been compromised by using the self-help machines for *ISSUING* library material?**

Please select at most one answer:

☐ Yes

☐ No

21 ***Did you notice any announcements, posters or instructions on using the self-help machines for *ISSUING* library material either on the Unisa web site or on campus?**

Please select at most one answer:

☐ Yes

☐ No

Section C: Using the self-help machines to RETURN library material

22 **Do you use the self-help machines to *RETURN* library material?** *

Please choose **only one** of the following:

☐ Yes

☐ No (If No, please list any reason/s in the comment box)

Please enter your comment here:

23 **If you answered Yes on question 22, please indicate how often you use the self-help machines to *RETURN* library material. If the answer on question 22 was No, please continue through the questions and only answer the ones marked with * while still following the instructions where applicable.**

Please select at most one answer:

☐ Once a week

☐ More than once a week

☐ Once a month

☐ More than once a month

☐ Once every 3 months

☐ Once every 6 months

☐ Once every 9 months

☐ Once a year

☐ Other:

24 **Please rate your overall satisfaction with using the self-help machines for *RETURNING* library material on the below scale- 1 being "Not satisfied at all" and 5 "Very satisfied".**

Please choose the appropriate option:

- [ ] 1
- [ ] 2
- [ ] 3
- [ ] 4
- [ ] 5

25 **Please rate the ease of using the self-help machines for *RETURNING* library material on the below scale- 1 being "Not easy at all" and 5 "Very easy".**

Please choose the appropriate option:

- [ ] 1
- [ ] 2
- [ ] 3
- [ ] 4
- [ ] 5

26 **Do you feel that the self-help machines for *RETURNING* library material saved you time while *RETURNING* library material?**

Please choose **only one** of the following:

- [ ] Yes
- [ ] No (if No, please list any reason/s in the comment box)

Please enter your comment here:

27 **If you encountered problems with using the self-help machines for *RETURNING* library material, please indicate what type of problems you encountered:**

Please choose **all** that apply:

☐ The machine was not working (out of order)

☐ The machine indicated that the library material could not be returned due to a problem with the library material

☐ The machine did not print a receipt

☐ Library material could not be returned because the return bin was full

☐ Other:

28 **Were the self-help machines for *RETURNING* library material accessible ie. placed conveniently so that you could return library material without any hinderance. Please indicate on the below scale- 1 being "Not accessible at all" and 5 "Very accessible".**

Please choose the appropriate option:

☐ 1

☐ 2

☐ 3

☐ 4

☐ 5

29 **Were the self-help machines for *RETURNING* library material accessible after hours when the library is closed?**

Please select at most one answer:

☐ Yes

☐ No

30 ***Did you receive training by library staff in the use of the self-help machines for *RETURNING* library material?**

☐ Yes

☐ No

31 ***Did the training assist you in using the self-help machines for *RETURNING* library material? If your answer on question 30 was No, please skip this question**.

Please choose **only one** of the following:

☐ Yes

☐ No (if No, please list any reason/s in the comment box)

Please enter your comment here:

32 ***If you did not receive training, do you feel that training would have assisted you in the better use of the self-help machines for *RETURNING* library material? If your answer on question 30 was Yes, please skip this question.**

Please select at most one answer:

☐ Yes

☐ No

33 ***Did you notice any announcements, posters or instructions on using the self-help machines for *RETURNING* library material either on the Unisa web site or on campus?**

Please select at most one answer:

☐ Yes

☐ No

34 **Thanks for participating in the survey!**

Any further comments?

Please write your answer here:

RFID self-help services on campus for issuing and returning books- circulation librarians

http://survey.unisa.ac.za/index.php/914744/lang-en

Dear Unisa library staff member,

I am a Unisa student and staff member busy with research for my MA Information Science dissertation. The dissertation topic is “The use of Radio Frequency Identification self-help circulation services for the delivery of user services at the University of South Africa Library Services”.

RFID self-help circulation services and equipment are available for use by Unisa students and staff to enable self-issue (check out) and self-return (check in) of library books on campuses of Unisa. The purpose of the research will be to establish which factors and best practice influence Radio Frequency Identification (RFID) self-help circulation services in South African academic libraries and what the advantages and disadvantages are of RFID by focusing on the Unisa Library Services.

As Unisa library staff member your valued input is crucial for this research to be relevant and successful. The findings will also assist Unisa Library Services to deliver an even more improved service to Unisa users. The survey should not take longer than 15-20 minutes to complete. Participation is completely voluntary. All participants will be treated as anonymous. Anonymity will be maintained by ensuring that it will not be possible to identify participants through the information they supply. All information supplied will be treated as confidential. Please take note that this research is bound by the “Unisa Policy on Research Ethics”. Ethical clearance for the research was obtained from the Senate Research Innovation and Higher Degrees Committee (SRIHC). By continuing with the completion of the survey, you give your consent and for the results to be used for research purposes only.

Thanks

Francois Keyser (Systems Librarian: Unisa Library)

There are 41 questions in this survey

Acceptance

1 **Please accept participation in the survey by choosing the appropriate option:** *

Please select at most one answer:

☒ Yes, I accept to participate in the survey

☐ No, I do not accept to participate in the survey (if No, please exit the survey)

Section A: Using the RFID self-help machines for issuing and returning library material

2 **On which campus are you located?**

Please select at most one answer:

☒ Cape Town

☐ East London

☐ Durban

☐ Nelspruit

☐ Polokwane

☐ Rustenburg

☐ Florida

☐ Johannesburg

☐ Pretoria (Muckleneuk)

☐ Sunnyside

3 **Were the RFID self-help machine/s for *ISSUING* library material placed in a location where you can easily monitor use?**

Please select at most one answer:

☐ Yes

☐ No

4 **Were the RFID self-help machine/s for *RETURNING* library material placed in a location where you can easily monitor use?**

Please select at most one answer:

☐ Yes

☐ No

5 **How do you ensure that library users rather use the RFID self-help machines meant for *SELF-ISSUING* and *SELF-RETURNING* of library material instead of the circulation services at the loan desk?**

Please write your answer here:

6 **Please rate your overall satisfaction with using the RFID equipment by using the below scales- 1 being "Not satisfied at all" and 5 "Very satisfied". If your library does not have a conversion station that is used solely for writing and editing information on tags, please do not rate the option for conversion station.**

	1	2	3	4	5
RFID self-help machine/s for ISSUING					
RFID self-help machine/s for RETURNING					
RFID staff workstation/s					
RFID conversion station					

7 **Please rate the ease of using the RFID equipment by using the below scales- 1 being "Not easy at all" and 5 "Very easy". If your library does not have a conversion station that is used solely for writing and editing information on tags, please do not rate the option for conversion station.**

	1	2	3	4	5
RFID self-help machine/s for ISSUING					
RFID self-help machine/s for RETURNING					
RFID staff workstation/s					
RFID conversion station					

8 **Is it easier to *ISSUE* and *RETURN* library material by using the RFID tags or the item barcodes in the library material?**

Please select at most one answer:

Easier using the RFID tags

Easier using the item barcodes

9 **Is library material renewable via the RFID self-help machine/s for *ISSUING*?**

Please choose **only one** of the following:

☐ Yes

☐ No (if No, please list any reasons in the comment box)

Please enter your comment here:

10 **Is audio-visual material *ISSUED* via the RFID self-help machine/s for *ISSUING* library material?**

Please choose **only one** of the following:

☐ Yes

☐ No (if No, please list any reasons in the comment box)

Please enter your comment here:

11 **Is audio-visual material *RETURNED* via the RFID self-help machine/s for *RETURNING* library material?**

Please choose **only one** of the following:

☐ Yes

☐ No (if No, please list any reasons in the comment box)

Please enter your comment here:

12 **Can more than one library material item be *ISSUED* simultaneously when using the RFID self-help machine/s for *ISSUING*?**

Please choose **only one** of the following:

☐ Yes

☐ No (if No, please list any reasons in the comment box)

Please enter your comment here:

13 **Can more than one library material item be *RETURNED* simultaneously when using the RFID self-help machine/s for *RETURNING*?**

Please choose **only one** of the following:

☐ Yes

☐ No (if No, please list any reasons in the comment box)

Please enter your comment here:

14 **Apart from *ISSUING* library material, are the self-help machine/s for *ISSUING* able to desensitise the security strips in library material?**

Please select at most one answer:

☐ Yes

☐ No

15 **Apart from *RETURNING* library material, are the self-help machine/s for *RETURNING* able to sensitise the security strips in library material?**

Please select at most one answer:

☐ Yes

☐ No

16 **How do you manage library material belonging to other Unisa libraries that is returned via your library's RFID self-help machine/s for RETURNING library material?**

Please write your answer here:

17 **For what purpose/s are the RFID staff workstation/s used?**

Please choose **all** that apply:

- ☐ Issuing
- ☐ Returning
- ☐ Sensitising security strips
- ☐ Desensitising security strips
- ☐ Writing and editing information on RFID tags

18 **If the RFID staff workstation/s are not used for sensitising, desensitising security strips or writing and editing of information on RFID tags, please indicate reasons why not:**

Please write your answer here:

19 **Did you receive training in the use of the RFID self-help machines for *ISSUING* and *RETURNING* library material?**

Please select at most one answer:

- ☐ Yes
- ☐ No
- ☐ I received training on only the RFID self-help machine/s for ISSUING
- ☐ I received training on only the RFID self-help machine/s for RETURNING

20 **Did the training enable you in better assisting library users in the use of the self-help machines for *ISSUING* and *RETURNING* library material? If your answer on question 19 was No, please skip this question.**

Please choose **only one** of the following:

☐ Yes

☐ No (if No, please list any reason/s in the comment box)

☐ No- the training on the RFID self-help machine/s for ISSUING did not enable me to better assist (please list any reason/s in the comment box)

☐ No- the training on the RFID self-help machine/s for RETURNING did not enable me to better assist (please list any reason/s in the comment box)

Please enter your comment here:

21 **If you did not receive training, do you feel that training would have enabled you to better assist users in the use of the RFID self-help machines for *ISSUING* and *RETURNING* library material? If your answer on question 19 was Yes, please skip this question.**

Please select at most one answer:

☐ Yes

☐ No

☐ No- training on the use of the RFID self-help machine/s for ISSUING would not have enabled me to better assist

☐ No- training on the use of the RFID self-help machine/s for RETURNING would not have enabled me to better assist

22 **Did you receive training in the use of the RFID staff workstation/s that are used at the loan desk?**

Please select at most one answer:

☐ Yes

☐ No

23 **Did the training enable you in using the RFID staff workstation/s at the loan desk? If your answer on question 22 was No, please skip this question.**

Please choose **only one** of the following:

☐ Yes

☐ No (if No, please list any reasons in the comment box)

Please enter your comment here:

24 **If you did not receive training, do you feel that training would have enabled you to better use the RFID staff workstation/s at the loan desk? If your answer on question 22 was Yes, please skip this question.**

Please select at most one answer:

☐ Yes

☐ No

25 **Did you receive training in the use of the RFID conversion station/s that are used solely for writing and editing the information on the RFID tags?**

Please select at most one answer:

☐ Yes

☐ No

☐ The library does not have a separate RFID conversion station

26 **Did the training enable you in using the RFID conversion workstation/s that are used solely for writing and editing the information on the RFID tags? If your answer on question 25 was No, please skip this question.**

Please choose **only one** of the following:

☐ Yes

☐ No (if No, please list any reasons in the comment box)

☒ The Library do not have a separate RFID conversion station

Please enter your comment here:

27 **If you did not receive training, do you feel that training would have enabled you to better use the RFID conversion station/s that are used solely for writing and editing the information on the RFID tags? If your answer on question 25 was Yes, please skip this question.**

Please select at most one answer:

☒ Yes

☒ No

☒ The library does not have a separate RFID conversion station

28 **Please rate any problems you encountered when assisting the library users with problems they experienced during the use of the self-help machines for *ISSUING* and *RETURNING* library material. Choose the appropriate rating of only the applicable problems listed below by indicating on a scale of 1-5 how negative the applicable problem affected the use of the self-help machines. 1 being "Very negative" and 5 being "Not negative at all" (negativity being determined by eg. the frequency of a problem occurring):**

	1	2	3	4	5
The RFID SELF-ISSUE machine/s was not working	☒	☒	☒	☒	☒
The RFID SELF-RETURN machine/s was not working	☒	☒	☒	☒	☒
The RFID SELF-ISSUE machine/s indicated that the library material could not be ISSUED due to a problem with the library material	☒	☒	☒	☒	☒
The RFID SELF-RETURN machine/s indicated that the library material could not be RETURNED due to a problem with the library material	☒	☒	☒	☒	☒
The RFID SELF-ISSUE machine/s did not print a due date slip	☒	☒	☒	☒	☒
The RFID SELF-RETURN machine/s did not print a receipt	☒	☒	☒	☒	☒

	1	2	3	4	5
The RFID SELF-ISSUE machine/s indicated there is a problem with the user's library account	☐	☐	☐	☐	☐
The RFID SELF-RETURN machine/s indicated there is a problem with the user's library account	☐	☐	☐	☐	☐
The RFID SELF-ISSUE machine/s could not read the user's university identification card	☐	☐	☐	☐	☐
The RFID SELF-ISSUE machine/s did not accept the user PIN	☐	☐	☐	☐	☐
The user was not allowed through the security turnstiles after ISSUING library material using the RFID SELF-ISSUE machine/s	☐	☐	☐	☐	☐
Library material could not be RETURNED as the RETURN bin was full	☐	☐	☐	☐	☐

29 **Please list and rate any other problems you encountered when assisting the library users with problems they experienced during the use of the self-help machines for *ISSUING* and *RETURNING* library material. Rate each problem on a scale of 1-5 how negative each of the problems affected the use of the self-help machines. 1 being "Very negative" and 5 being "Not negative at all" (negativity being determined by eg. the frequency of a problem occurring).**

Please write your answer here:

30 **Did you experience any problems with the RFID staff workstation/s?**

Please choose **only one** of the following:

☐ Yes (if Yes, please list any problems you might have experienced in the comment box)

☐ No

Please enter your comment here:

31 **Did you experience any problems with the RFID conversion station/s that are used solely for writing and editing information on the RFID tags?**

Please choose **only one** of the following:

☐ Yes (if Yes, please list any problems you might have experienced in the comment box)

☐ No

☐ The library does not have a separate RFID conversion station

Please enter your comment here:

32 **Please indicate if you experienced any problems due to the implementation of two different RFID self-help solutions at Unisa libraries (at least two types of self-issue and/or two types of self-return machines and/or two types of RFID staff workstations and/or two types of conversion stations)?**

Please choose **only one** of the following:

☐ Yes (if Yes, please list any problems in the comment box)

☐ No

Please enter your comment here:

33 **Please give an estimation of how many library material items you found without tags that could not be *ISSUED* or *RETURNED* via the RFID self-help machines or staff workstation/s since the RFID self-help machines and staff workstation/s for *ISSUING* and *RETURNING* library material have been in use.**

Please select at most one answer:

☐ None at all

☐ Less than ten

☐ 10-20

☐ 21-30

☐ 31-40

☐ 41-50

☐ 51-60

☐ 61-70

☐ 71-80

☐ 81-90

☐ 91-100

☐ More than 100

34 **Please give an estimation of how many library material items you found where the RFID self-help machines or staff workstation/s could not read the information on the RFID tags since the RFID self-help machines and staff workstation/s for *ISSUING* and *RETURNING* library material have been in use.**

Please select at most one answer:

☐ None at all

☐ Less than 10

☐ 10-20

☐ 21-30

☐ 31-40

☐ 41-50

☐ 51-60

☐ 61-70

☐ 71-80

☐ 81-90

☐ 91-100

☐ More than 100

35 **Please give an estimation of how many library material items you found that could not be *ISSUED* or *RETURNED* via the RFID self-help machines or staff workstation/s because the tags were removed or damaged since the RFID self-help machines and staff workstation/s have been in use.**

Please select at most one answer:

☐ None at all

☐ Less than 10

☐ 10-20

☐ 21-30

☐ 31-40

☐ 41-50

☐ 51-60

☐ 61-70

☐ 71-80

☐ 81-90

☐ 91-100

☐ More than 100

36 **Please give an estimation for the period January to December 2015 of the monthly average of library material items without RFID tags you found that could not be *ISSUED* or *RETURNED* via the RFID self-help machines or staff workstation/s.**

Please select at most one answer:

☐ None at all

☐ Less than 10

☐ 10-20

☐ 21-30

☐ 31-40

☐ 41-50

☐ 51-60

☐ 61-70

☐ 71-80

☐ 81-90

☐ 91-100

☐ More than 100

37 **Please give an estimation for the period January to December 2015 of the monthly average of library material items where the RFID tag information could not be read while being *ISSUED* or *RETURNED* via the RFID self-help machines or staff workstation/s.**

Please select at most one answer:

☐ None at all

☐ Less than 10

☐ 10-20

☐ 21-30

☐ 31-40

☐ 41-50

☐ 51-60

☐ 61-70

☐ 71-80

☐ 81-90

☐ 91-100

☐ More than 100

38 **Please give an estimation for the period January to December 2015 of the monthly average of library material items you found where the RFID tags were removed or damaged and hence could not be *ISSUED* or *RETURNED* via the RFID self-help machines or staff workstation/s. Remaining pieces of tags and glue are an indication of tags removed or damaged.**

Please select at most one answer:

☐ None at all

☐ Less than 10

☐ 10-20

☐ 21-30

☐ 31-40

☐ 41-50

☐ 51-60

☐ 61-70

☐ 71-80

☐ 81-90

☐ 91-100

☐ More than 100

39 **Did your role/responsibilities in the library change in the sense that you are now spending more time on delivering specialised library services to library users eg. training in accessing e-resources- instead of spending the same amount of time as before the RFID implementation on *ISSUING* and *RETURNING* library material to library users at the loan desk?**

Please choose **only one** of the following:

☐ Yes (if Yes, please indicate in comment box how your role/responsibilities changed)

☐ No

Please enter your comment here:

40 **Did you notice any form of change management as part of the implementation of the RFID self-help machines to *ISSUE* and *RETURN* library material? Change management usually entails communication of the new technology and implementation process through eg. meetings with staff and/or e-mails to staff to**

give them information on the implementation process, marketing of the new technology by using posters, Unisa web pages etc.

Please select at most one answer:

☐ Yes

☐ No

☐ It was not employed by Unisa Library during the implementation or did not use the RFID technology

41 **Thanks for participating in the survey!**

Any further comments?

Please write your answer here:

Shelving staff and RFID equipment for library staff use

http://survey.unisa.ac.za/index.php/685236/lang-en

Dear Unisa library staff member,

I am a Unisa student and staff member busy with research for my MA Information Science dissertation. The dissertation topic is “The use of Radio Frequency Identification self-help circulation services for the delivery of user services at the University of South Africa Library Services”.

RFID self-help circulation services and equipment are available for use by Unisa students and staff to enable self-issue (check out) and self-return (check in) of library books on campuses of Unisa. The purpose of the research will be to establish which factors and best practice influence Radio Frequency Identification (RFID) self-help circulation services in South African academic libraries and what the advantages and disadvantages are of RFID by focusing on the Unisa Library Services.

As Unisa library staff member your valued input is crucial for this research to be relevant and successful. The findings will also assist Unisa Library Services to deliver an even more improved service to Unisa users. The survey should not take longer than 15-20 minutes to complete. Participation is completely voluntary. All participants will be treated as anonymous. Anonymity will be maintained by ensuring that it will not be possible to identify participants through the information they supply. All information supplied will be treated as confidential. Please take note that this research is bound by the “Unisa Policy on Research Ethics”. Ethical clearance for the research was obtained from the Senate Research Innovation and Higher Degrees Committee (SRIHC). By continuing with the completion of the survey, you give your consent and for the results to be used for research purposes only.

Thanks

Francois Keyser (Systems Librarian: Unisa Library)

There are 24 questions in this survey

Acceptance

1 Please accept participation in the survey by choosing the appropriate option: *

Please select at most one answer

☐ Yes, I accept to participate in the survey

☐ No, I do not accept to participate in the survey (if No, please exit the survey)

Section A: Using the RFID sorter machine and staff workstation

2 Did the sorter machine enable you to sort and shelf books faster and easier?

Please select at most 2 answers

☐ Yes, faster

☐ Yes, easier

☐ No, not faster

☐ No, not easier

3 **If you answered Yes to question 2, please indicate how it made sorting and shelving faster and easier:**

Please write your answer here:

4 **If you answered No on question 2, please indicate why it did not make sorting and shelving faster and easier:**

Please write your answer here:

5 **Please rate your overall satisfaction with using the sorter machine for sorting books on the below scale- 1 being "Not satisfied at all" and 5 "Very satisfied".**

Please choose the appropriate option:

☐ 1

☐ 2

☐ 3

☐ 4

☐ 5

6 **Please rate the ease of using the sorter machine for sorting books on the below scale- 1 being "Not easy at all" and 5 "Very easy".**

Please choose the appropriate option:

☐ 1

☐ 2

☐ 3

☐ 4

☐ 5

7 **Please list the type of problems you encountered during using the sorter machine by listing them below:**

Please write your answer here:

8 **Did you receive training in the use of the sorter machine?**

Please select at most one answer

☐ Yes

☐ No

9 **Did the training assist you in using the sorter machine? If your answer on question 8 was No, please skip this question.**

Please choose **only one** of the following:

☐ Yes

☐ No (If No, please list any reason/s in the comment box)

Please enter your comment here:

10 **If you did not receive training, do you feel that training would have assisted you in the use of the sorter machine? If your answer on question 8 was Yes please skip this question.**

Please select at most one answer

☐ Yes

☐ No

11 **For what purpose/s are the RFID staff workstation/s used?**

Please choose **all** that apply:

☐ Issuing

☐ Returning

☐ Sensitising security strips

☐ Desensitising security strips

☐ Writing and editing information on RFID tags

12 **If the RFID staff workstation/s are not used for sensitising, desensitising security strips and writing and editing of information on RFID tags, please indicate reasons why not:**

Please write your answer here:

13 **Did you receive training in the use of the RFID staff workstation?**

Please select at most one answer

☐ Yes

☐ No

14 **Did the training assist you in using the RFID staff workstation?- If your answer on question 14 was No, please skip this question.**

Please choose **only one** of the following:

☐ Yes

☐ No (If No, please indicate reason/s in the comment box)

Please enter your comment here:

15 **If you did not receive training, do you feel that training would have assisted you in the use of the RFID staff workstation? If your answer on question 14 was Yes please skip this question.**

Please select at most one answer:

☐ Yes

☐ No

16 **Did you experience any problems with the RFID staff workstation?**

Please choose **only one** of the following:

☐ Yes (please list any problem/s you might have experienced in the comment box)

☐ No

Please enter your comment here:

17 **Since the RFID sorter machine and staff workstation have been in use, did you find any books without RFID tags? Please give an estimation by indicating below how many books you found without tags.**

Please select at most one answer

☐ None at all

☐ Less than ten

☐ 10-20

☐ 21-30

☐ 31-40

☐ 41-50

☐ 51-60

☐ 61-70

☐ 71-80

☐ 81-90

☐ 91-100

☐ More than 100

18 **Since the RFID sorter machine and staff workstation have been in use, did you find any books where the RFID equipment could not read the information on the RFID tags? Please give an estimation by indicating below how many books you found where the tag information could not be read.**

Please select at most one answer

☐ None at all

☐ Less than 10

☐ 10-20

☐ 21-30

☐ 31-40

☐ 41-50

☐ 51-60

☐ 61-70

☐ 71-80

☐ 81-90

☐ 91-100

☐ More than 100

19**Since the RFID sorter machine and staff workstation have been in use, did you find any books where the RFID tags were removed or damaged? Remaining pieces of tags and glue are an indication of tags removed or damaged. Please give an estimation by indicating below how many books you found where the RFID tags were removed or damaged.**

Please select at most one answer

- [x] None at all
- [ ] Less than 10
- [ ] 10-20
- [ ] 21-30
- [ ] 31-40
- [ ] 41-50
- [ ] 51-60
- [ ] 61-70
- [ ] 71-80
- [ ] 81-90
- [ ] 91-100
- [ ] More than 100

20 **Please give an estimation for the period January to December 2015 of the monthly average of library material items without RFID tags you found.**

Please select at most one answer

- [x] None at all
- [ ] Less than 10
- [ ] 10-20
- [ ] 21-30
- [ ] 31-40

☐ 41-50

☐ 51-60

☐ 61-70

☐ 71-80

☐ 81-90

☐ 91-100

☐ More than 100

21 **Please give an estimation for the period January to December 2015 of the monthly average of library material items you found where the information on the tags could not be read.**

Please select at most one answer

☐ None at all

☐ Less than 10

☐ 10-20

☐ 21-30

☐ 31-40

☐ 41-50

☐ 51-60

☐ 61-70

☐ 71-80

☐ 81-90

☐ 91-100

☐ More than 100

22 **Please give an estimation for the period January to December 2015 of the monthly average of library material items that you found where the RFID tags were removed or damaged. Remaining pieces of tags and glue are an indication of tags removed or damaged.**

Please select at most one answer

☐ None at all

☐ Less than 10

☐ 10-20

☐ 21-30

☐ 31-40

☐ 41-50

☐ 51-60

☐ 61-70

☐ 71-80

☐ 81-90

☐ 91-100

☐ More than 100

23 **Did you notice any form of change management as part of the implementation of the RFID sorter machine and staff workstation? Change management usually entails communication of the new technology and implementation process**

through eg. meetings with staff and/or e-mails to staff to give them information on the implementation process, marketing of the new technology by using posters etc.

Please select at most one answer

☐ Yes

☐ No

24 **Thanks for participating in the survey!**

Any further comments?

Please write your answer here:

RFID delivery and receiving of postal library material

http://survey.unisa.ac.za/index.php/116974/lang-en

Dear Unisa library staff member,

I am a Unisa student and staff member busy with research for my MA Information Science dissertation. The dissertation topic is “The use of Radio Frequency Identification self-help circulation services for the delivery of user services at the University of South Africa Library Services”.

RFID self-help circulation services and equipment are available for use by Unisa students and staff to enable self-issue (check out) and self-return (check in) of library books on campuses of Unisa. The purpose of the research will be to establish which factors and best practice influence Radio Frequency Identification (RFID) self-help circulation services in South African academic libraries and what the advantages and disadvantages are of RFID by focusing on the Unisa Library Services.

As Unisa library staff member your valued input is crucial for this research to be relevant and successful. The findings will also assist Unisa Library Services to deliver an even more improved service to Unisa users. The survey should not take longer than 15-20 minutes to complete. Participation is completely voluntary. All participants will be treated as anonymous. Anonymity will be maintained by ensuring that it will not be possible to identify participants through the information they supply. All information supplied will be treated as confidential. Please take note that this research is bound by the “Unisa Policy on Research Ethics”. Ethical clearance for the research was obtained from the Senate Research Innovation and Higher Degrees Committee (SRIHC). By continuing with the completion of the survey, you give your consent and for the results to be used for research purposes only.

Thanks

Francois Keyser (Systems Librarian: Unisa Library)

There are 18 questions in this survey

Acceptance

1 **Please accept participation in the survey by choosing the appropriate option: ***

Please select at most one answer:

☒ Yes, I accept to participate in the survey

☒ No, I do not accept to participate in the survey (if No, please exit the survey)

Section A: RFID tagging of library material

2 **For what purpose do you use the RFID staff workstation/s?**

Please write your answer here:

3 **Did you receive training in the use of the RFID staff workstation/s?**

Please select at most one answer:

☐ Yes

☐ No

4 **Did the training enable you to better use the RFID staff workstation/s? If your answer on question 3 was No, please skip this question.**

Please choose **only one** of the following:

☐ Yes

☐ No (if No, please list any reason/s in the comment box)

Please enter your comment here:

5 **If you did not receive training, do you feel that training would have enabled you to better use the RFID staff workstation/s?**

Please select at most one answer:

☐ Yes

☐ No

6 **Please rate your overall satisfaction with using the RFID staff workstation/s by using the below scales- 1 being "Not satisfied at all" and 5 "Very satisfied".**

Please choose **only one** of the following:

☐ 1

☐ 2

☐ 3

☐ 4

☐ 5

7 **Please rate the ease of using the RFID staff workstation/s by using the below scales- 1 being "Not easy at all" and 5 "Very easy".**

Please choose **only one** of the following:

☐ 1

☐ 2

☐ 3

☐ 4

☐ 5

8 **Is it easier to ISSUE and RETURN library material by using the RFID tags or the item barcodes in the library material?**

Please select at most one answer:

☐ Easier using the RFID tags

☐ Easier using the item barcodes

9 **Please list and rate any problems you encountered while using the RFID staff workstation/s. Rate each problem on a scale of 1-5 how negative each of the problems affected the use of the staff workstation/s. 1 being "Very negative " and 5 being "Not negative at all" (negativity being determined by eg. the frequency of a problem occurring):**

Please write your answer here:

10 **Please indicate if you experienced any problems due to the implementation of two types of RFID staff workstation/s.**

Please choose **only one** of the following:

☐ Yes (if Yes, please list any problems in the comment box)

☐ No

Please enter your comment here:

11 **Please give an estimation of how many library material items you found without tags that could not be *ISSUED* or *RETURNED* via the RFID staff workstation/s since the RFID staff workstation/s for *ISSUING* and *RETURNING* library material have been in use:**

Please select at most one answer:

☐ None at all

☐ Less than 10

☐ 10-20

☐ 21-30

☐ 31-40

☐ 41-50

☐ 51-60

☐ 61-70

☐ 71-80

☐ 81-90

☐ 91-100

☐ More than 100

12 **Please give an estimation of how many library material items you found where the RFID staff workstation/s could not read the information on the RFID tags**

since the RFID staff workstation/s for ISSUING and RETURNING library material have been in use:

Please select at most one answer:

- ☐ None at all
- ☐ Less than 10
- ☐ 10-20
- ☐ 21-30
- ☐ 31-40
- ☐ 41-50
- ☐ 51-60
- ☐ 61-70
- ☐ 71-80
- ☐ 81-90
- ☐ 91-100
- ☐ More than 100

13 **Please give an estimation of how many library material items you found that could not be ISSUED or RETURNED via the RFID staff workstation/s because the tags were removed or damaged since the RFID staff workstation/s have been in use. Remaining pieces of tags and glue are an indication of tags removed or damaged.**

Please select at most one answer:

- ☐ None at all

☐ Less than 10

☐ 10-20

☐ 21-30

☐ 31-40

☐ 41-50

☐ 51-60

☐ 61-70

☐ 71-80

☐ 81-90

☐ 91-100

☐ More than 100

14 **Please give an estimation for the period January to December 2015 of the monthly average of library material items without RFID tags you found that could not be ISSUED or RETURNED via the RFID staff workstation/s:**

Please select at most one answer:

☐ None at all

☐ Less than 10

☐ 10-20

☐ 21-30

☐ 31-40

☐ 41-50

☐ 51-60

☐ 61-70

☐ 71-80

☐ 81-90

☐ 91-100

☐ More than 100

15 **Please give an estimation for the period January to December 2015 of the monthly average of library material items where the RFID tag information could not be read while being ISSUED or RETURNED via the RFID staff workstation/s:**

Please select at most one answer:

☐ None at all

☐ Less than 10

☐ 10-20

☐ 21-30

☐ 31-40

☐ 41-50

☐ 51-60

☐ 61-70

☐ 71-80

☐ 81-90

☐ 91-100

☐ More than 100

16 **Please give an estimation for the period January to December 2015 of the monthly average of library material items you found where the RFID tags were removed or damaged and hence could not be ISSUED or RETURNED via the RFID staff workstation/s. Remaining pieces of tags and glue are an indication of tags removed or damaged.**

Please select at most one answer:

☐ None at all

☐ Less than 10

☐ 10-20

☐ 21-30

☐ 31-40

☐ 41-50

☐ 51-60

☐ 61-70

☐ 71-80

☐ 81-90

☐ 91-100

☐ More than 100

17 **Did you notice any form of change management as part of the implementation of the RFID equipment? Change management usually entails communication of the new technology and implementation process through eg. meetings with staff and/or e-mails to staff to give them information on the implementation process, marketing of the new technology by using posters, Unisa web pages etc.**

Please select at most one answer:

☐ Yes

☐ No

18 **Thanks for participating in the survey!**

Any further comments?

Please write your answer here:

RFID tagging of library material- acquisitions tagging staff

http://survey.unisa.ac.za/index.php/658138/lang-en

Dear Unisa library staff member,

I am a Unisa student and staff member busy with research for my MA Information Science dissertation. The dissertation topic is “The use of Radio Frequency Identification self-help circulation services for the delivery of user services at the University of South Africa Library Services”.

RFID self-help circulation services and equipment are available for use by Unisa students and staff to enable self-issue (check out) and self-return (check in) of library books on campuses of Unisa. The purpose of the research will be to establish which factors and best practice influence Radio Frequency Identification (RFID) self-help circulation services in South African academic libraries and what the advantages and disadvantages are of RFID by focusing on the Unisa Library Services.

As Unisa library staff member your valued input is crucial for this research to be relevant and successful. The findings will also assist Unisa Library Services to deliver an even more improved service to Unisa users. The survey should not take longer than 15-20 minutes to complete. Participation is completely voluntary. All participants will be treated as anonymous. Anonymity will be maintained by ensuring that it will not be possible to identify participants through the information they supply. All information supplied will be treated as confidential. Please take note that this research is bound by the “Unisa Policy on Research Ethics”. Ethical clearance for the research was obtained from the Senate Research Innovation and Higher Degrees Committee (SRIHC). By continuing with the completion of the survey, you give your consent and for the results to be used for research purposes only.

Thanks

Francois Keyser (Systems Librarian: Unisa Library)

There are 12 questions in this survey

Acceptance

1 **Please accept participation in the survey by choosing the appropriate option: ***

Please select at most one answer

☐ Yes, I accept to participate in the survey

☐ No, I do not accept to participate in the survey (if No, please exit the survey)

Section A: RFID tagging of library material

2 **Describe the tagging of books.**

Please write your answer here:

3 **Describe the tagging of CDs, DVDs.**

Please write your answer here:

4 **Did you receive training in the use of the staff conversion station/s?**

Please select at most one answer:

☐ Yes

☐ No

5 **Did the training enable you to better use the staff conversion station/s? If your answer on question 4 was No, please skip this question.**

Please choose **only one** of the following:

☐ Yes

☐ No (if No, please list any reason/s in the comment box)

Please enter your comment here:

6 **If you did not receive training, do you feel that training would have enabled you to better use the conversion station/s? If your answer on question 4 was Yes, please skip this question.**

Please select at most one answer:

☐ Yes

☐ No

7 **Please rate your overall satisfaction with using the staff conversion station/s by using the below scales- 1 being "Not satisfied at all" and 5 "Very satisfied".**

Please choose **only one** of the following:

☐ 1

☐ 2

☐ 3

☐ 4

☐ 5

8 **Please rate the ease of using the staff conversion station/s by using the below scales- 1 being "Not easy at all" and 5 "Very easy".**

Please choose **only one** of the following:

☐ 1

☐ 2

☐ 3

☐ 4

☐ 5

9 **Please list and rate any problems you encountered while using the staff conversion station/s for tagging. Rate each problem on a scale of 1-5 how negative each of the problems affected the use of the conversion station/s. 1 being "Very negative" and 5 being "Not negative at all " (negativity being determined by eg. the frequency of a problem occurring):**

Please write your answer here:

10 **Please indicate if you experienced any problems due to the implementation of two types of staff conversion station/s.**

Please choose **only one** of the following:

☐ Yes (if Yes, please list any problems in the comment box)

☐ No

Please enter your comment here:

11 **Did you notice any form of change management as part of the implementation of the RFID equipment? Change management usually entails communication of the new technology and implementation process through eg. meetings with staff and/or e-mails to staff to give them information on the implementation process, marketing of the new technology by using posters, Unisa web pages etc.**

Please select at most one answer:

☐ Yes

☐ No

12 **Thanks for participating in the survey!**

Any further comments?

Please write your answer here:

RFID inventory control

http://survey.unisa.ac.za/index.php/685236?lang=en

Dear Unisa library staff member,

I am a Unisa student and staff member busy with research for my MA Information Science dissertation. The dissertation topic is “The use of Radio Frequency Identification self-help circulation services for the delivery of user services at the University of South Africa Library Services”.

RFID self-help circulation services and equipment are available for use by Unisa students and staff to enable self-issue (check out) and self-return (check in) of library books on campuses of Unisa. The purpose of the research will be to establish which factors and best practice influence Radio Frequency Identification (RFID) self-help circulation services in South African academic libraries and what the advantages and disadvantages are of RFID by focusing on the Unisa Library Services.

As Unisa library staff member your valued input is crucial for this research to be relevant and successful. The findings will also assist Unisa Library Services to deliver an even more improved service to Unisa users. The survey should not take longer than 15-20 minutes to complete. Participation is completely voluntary. All participants will be treated as anonymous. Anonymity will be maintained by ensuring that it will not be possible to identify participants through the information they supply. All information supplied will be treated as confidential. Please take note that this research is bound by the “Unisa Policy on Research Ethics”. Ethical clearance for the research was obtained from the Senate Research Innovation and Higher Degrees Committee (SRIHC). By continuing with the completion of the survey, you give your consent and for the results to be used for research purposes only.

Thanks

Francois Keyser (Systems Librarian: Unisa Library)

There are 7 questions in this survey

Acceptance

1 Please accept participation in the survey by choosing the appropriate option: *

Please select at most one answer:

☐ Yes, I accept to participate in the survey

☐ No, I do not accept to participate in the survey (if No, please exit the survey)

Section A: RFID inventory control

2 Please indicate the requirements for inventory control after RFID implementation.

Please write your answer here:

3 **What did the investigation into RFID inventory control entailed?**

Please write your answer here:

4 **Is RFID used for inventory control?**

Please select at most one answer:

☐ Yes

☐ No

5 **If RFID is not used for inventory control, please list reasons why it is not used for that purpose.**

Please write your answer here:

6 **Did you notice any form of change management as part of the implementation of the RFID equipment? Change management usually entails communication of the new technology and implementation process through eg. meetings with staff and/or e-mails to staff to give them information on the implementation process, marketing of the new technology by using posters, Unisa web pages etc.**

Please select at most one answer:

☐ Yes

☐ No

7 **Thanks for participating in the survey!**

Any further comments?

Please write your answer here:

RFID self-help services- systems librarians

http://survey.unisa.ac.za/index.php/139981/lang-en

Dear Unisa library staff member,

I am a Unisa student and staff member busy with research for my MA Information Science dissertation. The dissertation topic is “The use of Radio Frequency Identification self-help circulation services for the delivery of user services at the University of South Africa Library Services”.

RFID self-help circulation services and equipment are available for use by Unisa students and staff to enable self-issue (check out) and self-return (check in) of library books on campuses of Unisa. The purpose of the research will be to establish which factors and best practice influence Radio Frequency Identification (RFID) self-help circulation services in South African academic libraries and what the advantages and disadvantages are of RFID by focusing on the Unisa Library Services.

As Unisa library staff member your valued input is crucial for this research to be relevant and successful. The findings will also assist Unisa Library Services to deliver an even more improved service to Unisa users. The survey should not take longer than 15-20 minutes to complete. Participation is completely voluntary. All participants will be treated as anonymous. Anonymity will be maintained by ensuring that it will not be possible to identify participants through the information they supply. All information supplied will be treated as confidential. Please take note that this research is bound by the “Unisa Policy on Research Ethics”. Ethical clearance for the research was obtained from the Senate Research Innovation and Higher Degrees Committee (SRIHC). By continuing with the completion of the survey, you give your consent and for the results to be used for research purposes only.

Thanks

Francois Keyser (Systems Librarian: Unisa Library)

There are 25 questions in this survey

Acceptance

1 **Please accept participation in the survey by choosing the appropriate option: ***

Please select at most one answer:

☐ Yes, I accept to participate in the survey

☐ No, I do not accept to participate in the survey (if No, please exit the survey)

Section A: Using the RFID self-help machines for issuing and returning library material

2 **When was RFID self-help circulation services implemented?**

Please write your answer here:

3 **Was project management part of the implementation of the RFID self-help circulation services?**

Please choose **only one** of the following:

☐ Yes (if Yes, please indicate what form it took)

☐ No

Please enter your comment here:

4 How was tagging of library material approached?

Please write your answer here:

5 Are the tags used for security purposes?

Please choose **only one** of the following:

☐ Yes

☐ No (if No, please list any reasons in the comment box)

Please enter your comment here:

6 Were different RFID self-help circulation systems evaluated before obtaining and implementation?

Please choose **only one** of the following:

☐ Yes (If Yes, please explain the evaluation process in the comment box)

☐ No

Please enter your comment here:

7 Do the RFID systems comply with RFID standards like a standard radio frequency to enable reading of different types of RFID tags?

Please choose **only one** of the following:

☐ Yes (if Yes, please indicate in the comment box in which ways it comply)

☐ No (if No, please indicate in the comment box in which ways it do not comply)

☐ Partially (please indicate in the comment box in which ways it do and do not comply)

Please enter your comment here:

8 **Was integration of the LMS and RFID software successful in all aspects?**

Please choose **only one** of the following:

☐ Yes (if Yes, please indicate how it was successful)

☐ No (if No, please indicate how it was not successful)

☐ Partially (please indicate in the comment box how it was successful and not successful)

Please enter your comment here:

9 **Did you notice any form of change management as part of the implementation of the RFID equipment? Change management usually entails communication of the new technology and implementation process through eg. meetings with staff and/or e-mails to staff to give them information on the implementation process, marketing of the new technology by using posters, Unisa web pages etc.**

Please select at most one answer:

☐ Yes

☐ No

10 **Did you receive training in the maintenance and support of the RFID equipment?**

Please select at most one answer:

☐ Yes

☐ No

11 **Did the training enable you in better maintaining and supporting the RFID equipment? If your answer on question 10 was No, please skip this question.**

Please choose **only one** of the following:

☐ Yes

☐ No (if No, please list any reason/s in the comment box)

Please enter your comment here:

12 **If you did not receive training, do you feel that training would have enabled you to better maintain and support the RFID equipment? If your answer on question 10 was Yes please skip this question.**

Please select at most one answer:

☐ Yes

☐ No

13 **Please rate your overall satisfaction while maintaining and supporting the RFID equipment by using the below scales- 1 being "Not satisfied at all" and 5 "Very satisfied".**

	1	2	3	4	5
RFID self-help machine/s for ISSUING	☐	☐	☐	☐	☐
RFID self-help machine/s for RETURNING	☐	☐	☐	☐	☐
RFID staff workstation/s	☐	☐	☐	☐	☐
RFID conversion station/s	☐	☐	☐	☐	☐
Sorter machine	☐	☐	☐	☐	☐

14 **Is library material renewable via the RFID self-help machine/s for *ISSUING?***

Please choose **only one** of the following:

☐ Yes

☐ No (if No, please list any reasons in the comment box)

Please enter your comment here:

15 **Is audio-visual material *ISSUED* via the RFID self-help machine/s for *ISSUING* library material?**

Please choose **only one** of the following:

☐ Yes

☐ No (if No, please list any reasons in the comment box)

Please enter your comment here:

16 **Is audio-visual material *RETURNED* via the RFID self-help machine/s for *RETURNING* library material?**

Please choose **only one** of the following:

☐ Yes

☐ No (if No, please list any reasons in the comment box)

Please enter your comment here:

17 **Can more than one library material item be *ISSUED* simultaneously when using the RFID self-help machine/s for *ISSUING*?**

Please choose **only one** of the following:

☐ Yes

☐ No (if No, please list any reasons in the comment box)

Please enter your comment here:

18 **Can more than one library material item be *RETURNED* simultaneously when using the RFID self-help machine/s for *RETURNING*?**

Please choose **only one** of the following:

☐ Yes

☐ No (if No, please list any reasons in the comment box)

Please enter your comment here:

19 **Apart from *ISSUING* library material, are the self-help machine/s for *ISSUING* able to desensitise the security strips in library material?**

Please select at most one answer

☐ Yes

☐ No

20 **Apart from *RETURNING* library material, are the self-help machine/s for *RETURNING* able to sensitise the security strips in library material?**

Please select at most one answer:

☐ Yes

☐ No

21 **If the RFID staff workstation/s are not used for sensitising, desensitising security strips and writing and editing of information on RFID tags, please indicate reasons why not:**

Please write your answer here:

22 **Please rate any problems you encountered when maintaining and supporting the RFID equipment. Choose the appropriate rating of only the applicable problems listed below by indicating on a scale of 1-5 how negative the applicable problem affected the use of the self-help machines. 1 being "Very negative" and 5 being "Not negative at all" (negativity being determined by eg. the frequency of a problem occurring):**

	1	2	3	4	5
The RFID SELF-ISSUE machine/s was not working					
The RFID SELF-RETURN machine/s was not working					
The RFID SELF-ISSUE machine/s indicated that the library material could not be ISSUED due to a problem with the library material					
The RFID SELF-RETURN machine/s indicated that the library material could not be RETURNED due to a problem with the library material					
The RFID SELF-ISSUE machine/s did not print a due date slip					
The RFID SELF-RETURN machine/s did not print a receipt					
The RFID SELF-ISSUE machine/s indicated there is a problem with the user's library account					
The RFID SELF-RETURN machine/s indicated there is a problem with the user's library account					
The RFID SELF-ISSUE machine/s could not read the user's university identification card					
The RFID SELF-ISSUE machine/s did not accept the user PIN					
The user was not allowed through the security turnstiles after ISSUING library material using the RFID SELF-ISSUE machine/s					
Library material could not be RETURNED as the RETURN bin was full					
The RFID staff workstation/s was not working					
The RFID conversion station/s was not working					
The sorter machine was not working					
The sorter machine did not sort library material into the correct bin					

23 **Please list and rate any other problems you encountered when maintaining and supporting the RFID equipment. Rate each problem on a scale of 1-5 how negative each of the problems affected the use of the self-help machines. 1 being "Very negative" and 5 being "Not negative at all" (negativity being determined by eg. the frequency of a problem occurring):**

Please write your answer here:

24 **Please indicate if you experienced any problems due to the implementation of two different RFID self-help solutions at Unisa libraries (at least two types of self-issue and/or two types of self-return machines and/or two types of RFID staff workstations and/or two types of conversion stations)?**

Please choose **only one** of the following:

☐ Yes (if Yes, please list any problems in the comment box)

☐ No

Please enter your comment here:

25 **Thanks for participating in the survey!**

Any further comments?

Please write your answer here:

RFID self-help services- library management

http://survey.unisa.ac.za/index.php/614172?lang=en

Dear Unisa library staff member,

I am a Unisa student and staff member busy with research for my MA Information Science dissertation. The dissertation topic is “The use of Radio Frequency Identification self-help circulation services for the delivery of user services at the University of South Africa Library Services”.

RFID self-help circulation services and equipment are available for use by Unisa students and staff to enable self-issue (check out) and self-return (check in) of library books on campuses of Unisa. The purpose of the research will be to establish which factors and best practice influence Radio Frequency Identification (RFID) self-help circulation services in South African academic libraries and what the advantages and disadvantages are of RFID by focusing on the Unisa Library Services.

As Unisa library staff member your valued input is crucial for this research to be relevant and successful. The findings will also assist Unisa Library Services to deliver an even more improved service to Unisa users. The survey should not take longer than 15-20 minutes to complete. Participation is completely voluntary. All participants will be treated as anonymous. Anonymity will be maintained by ensuring that it will not be possible to identify participants through the information they supply. All information supplied will be treated as confidential. Please take note that this research is bound by the “Unisa Policy on Research Ethics”. Ethical clearance for the research was obtained from the Senate Research Innovation and Higher Degrees Committee (SRIHC). By continuing with the completion of the survey, you give your consent and for the results to be used for research purposes only.

Thanks

Francois Keyser (Systems Librarian: Unisa Library)

There are 17 questions in this survey

Acceptance

1 **Please accept participation in the survey by choosing the appropriate option:** *

Please select at most one answer:

☐ Yes, I accept to participate in the survey

☐ No, I do not accept to participate in the survey (if No, please exit the survey)

2 **When was RFID self-help circulation services implemented?**

Please write your answer here:

3 **What were the key objectives for implementing RFID self-help services at Unisa Library Services?**

Please write your answer here:

4 **Which of the objectives were achieved?**

Please write your answer here:

5 **Please highlight reasons for the objectives that were not achieved.**

Please write your answer here:

6 **Were any feasibility studies conducted regarding obtaining and implementation of the RFID self-help services?**

Please choose **only one** of the following:

☐ Yes (if Yes, please indicate in comment box what the feasibility study entailed)

☐ No

Please enter your comment here:

7 **Were different RFID self-help services evaluated before obtaining and implementation? ***

Please choose **only one** of the following:

☐ (If Yes, please indicate how it was done)

☐ No

Please enter your comment here:

8 **Was project management part of the implementation of the RFID self-help services?**

Please select at most one answer:

☐ Yes

☐ No

9 **What form did project management take?**

Please write your answer here:

10 **Who was responsible for project management?**

Please write your answer here:

11 **Did change management form part of the implementation of RFID self-help services?**

Please select at most one answer:

☐ Yes

☐ No

12 **What form did change management take?**

Please write your answer here:

13 **Does the RFID system comply with RFID standards like standard RFID frequency regarding reading of tags?**

Please choose **only one** of the following:

☐ Yes (if Yes, please indicate in the comment box in which ways it complies)

☐ No (if No, please indicate in the comment box in which ways it does not comply)

☐ Partially (please indicate in the comment box in which ways it does and does not comply)

Please enter your comment here:

14 **Was integration of the LMS and RFID software successful in all aspects?**

Please choose **only one** of the following:

☐ Yes (if Yes, please indicate in the comment box how it was successful)

☐ No (if No, please indicate in the comment box why it was not successful)

☐ Partially (please indicate in the comment box how it was successful and not successful)

Please enter your comment here:

15 **How was tagging of library material approached?**

Please write your answer here:

16 **Were any changes to buildings necessary to cater for the implementation of the RFID self-help services?**

Please choose **only one** of the following:

☐ Yes (If Yes, please indicate in the comment box which changes were necessary)

☐ No

Please enter your comment here:

17 **Thanks for participating in the survey!**

Any further comments?

Please write your answer here:

ANNEXURE 2

LETTER OF CONSENT TO RESPONDENTS

Dear Unisa student or staff member,

I am a Unisa student and staff member busy with research for my MA Information Science dissertation. The dissertation topic is “The use of Radio Frequency Identification self-help circulation services for the delivery of user services at the University of South Africa Library Services”.

RFID self-help circulation services and equipment are available for use by Unisa students and staff to enable self-issue (check out) and self-return (check in) of library books on campuses of Unisa. The purpose of the research will be to establish which factors and best practice influence Radio Frequency Identification (RFID) self-help circulation services in South African academic libraries and what the advantages and disadvantages are of RFID by focusing on the Unisa Library Services.

As Unisa student or staff member your valued input is crucial for this research to be relevant and successful. The findings will also assist Unisa Library Services to deliver an even more improved service to Unisa users. The survey should not take longer than 15-20 minutes to complete. Participation is completely voluntary. All participants will be treated as anonymous. Anonymity will be maintained by ensuring that it will not be possible to identify participants through the information they supply. All information supplied will be treated as confidential. Please take note that this research is bound by the “Unisa Policy on Research Ethics”. Ethical clearance for the research was obtained from the Senate Research Innovation and Higher Degrees Committee (SRIHC). By continuing with the completion of the survey, you give your consent and for the results to be used for research purposes only.

Thanks

Francois Keyser (Systems Librarian: Unisa Library)